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RAIL-ROAD NEWS.

A Tunnel at Albany.

A Bill for the incorporation of a Tunnel Co., to be constructed underneath the waters of the Hudson, at the good old city of Albany, is again before the people there. The capital of the company is to be $500,000, to be divided into shares of $100 each. Robert H. Pruyn, Henry H. Martin, Franklin Townsend, Peter Cagger, and Hamilton Harris are commissioners, th solicit subscriptions. The work is to be commenced within ten years, and when $200,000 shall be paid in. It is projected to construct the Tunnel of sufficient size to lay down a double track, and with carriage and foot-passenger ways. The Bill is now before the Railroad Committee of the Legislature. We presume the gentlemen composing it will have the estimates laid before them for constructing such a tunnel for half a million of dollars. The work, we suppose, is intended to be constructed on the most economical principles, so economical, indeed, that we humbly believe the question of expense has been but very superficially considered. A railway tunnel, under any river, always involves, the expense of an incline at each side. This question of a tunnel at Albany is an old hobby; it will be a long time before it is constructed.

Railroad Accidents.

The New York Daily Times, in a long editorial on the subject of railroad accidents, respecting which the editor has had an abundance of sad experience in witnessing quite a number, he thus concludes his opinions respecting the causes and his remedy for the same:—

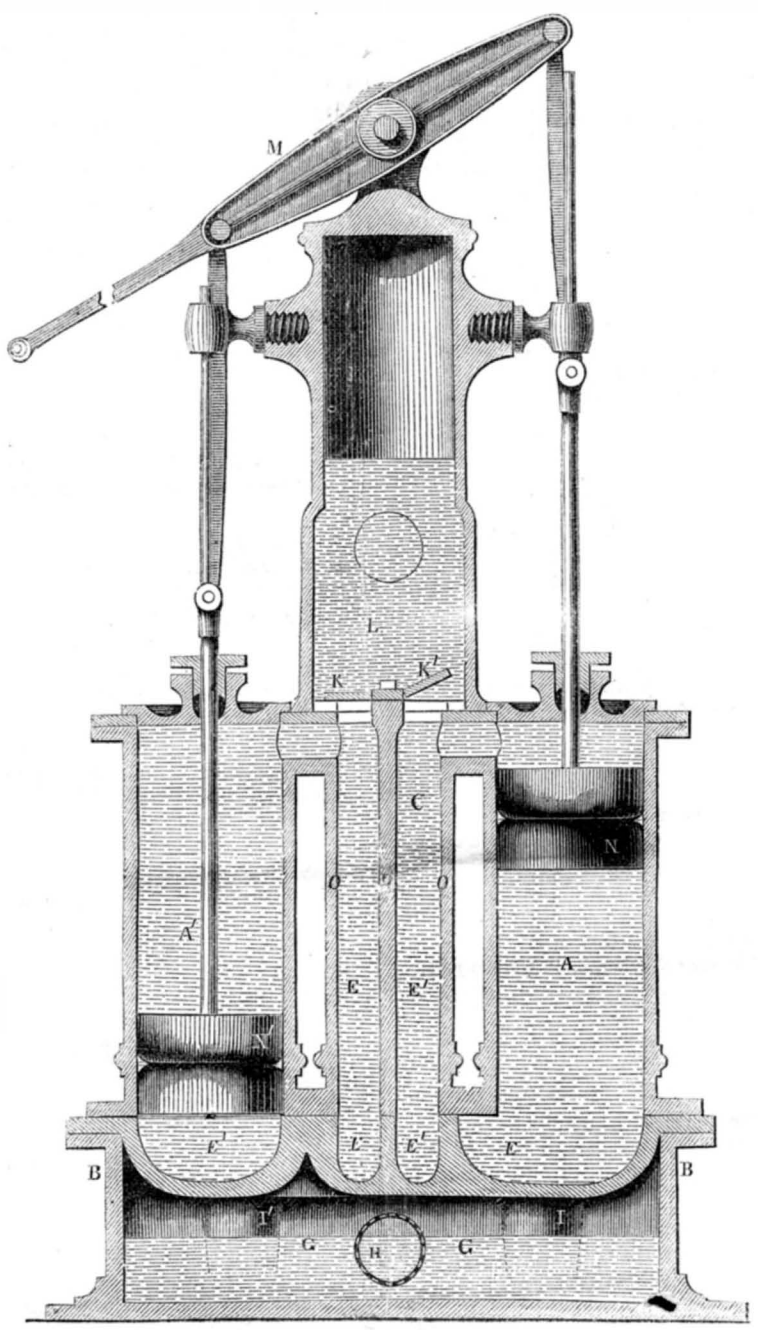
"In every case of railroad disaster, so far as we know—the catastrophe has not been an "accident" in any just sense of the word. It has been produced by distinct, adequate, and easily foreseen causes—such causes as it is the duty of the railroad companies to foresee and remove. And the companies are directly to blame for all these disasters. They are guilty, morally and actually, for all loss of life and property that may occur. And while under existing circumstances and laws, it is impossible to hold them properly accountable, damages may be, and ought to be, recovered.

It is clear that the only remedy for such disasters—the only way in which they can be effectually prevented—is by employing a higher, more intelligent, and more responsible class of men, in all departments of railroad management, from the highest to the lowest."

Railroad Fares.

At the annual meeting of the Vermont and Massachusetts Railroad Company, held last week, President Whittemore declared it "as his settled conviction that the railroads of New England must combine to raise the prices on all the roads, in order to save themselves." He said that, "if the present rates were doubled, the interior roads might possibly divide 6 per cent.

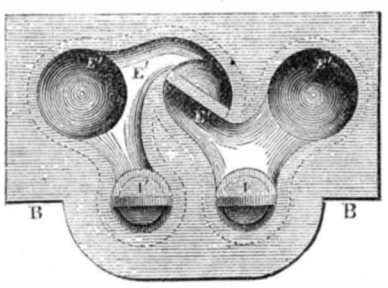
BROWN'S FORCE PUMP.---Fig. 1.



This pump is one for which a patent was secured recently in England, by Mr. Robert Brown, of Liverpool. The arrangement and combination of its parts are peculiar. As pumps are so universally useful and necessary they are important machines, and are subjects of interest to all our citizens. This is the reason why we present an engraving of it. Two double acting pumps are so arranged that one inlet and one outlet valve for each are sufficient to maintain the action of both pumps.

Fig. 1 is a vertical section, and fig. 2 is a plan view of the base plate on a smaller scale

Fig 2



A A′ are two double-acting pumps, which are bolted on the plate, B B, so as to cover the cavities in that plate; and also the channels forming the different connections thereto. A third cylinder, C, is placed between the pump-barrels, which is divided vertically, by a partition, D, into two channels, E E′, communicating with the channels, F F′, in the plate, and form the inlet passages to the pumps. The cavity, in the base, G G, is supplied with water from a perforated pipe, H, by which it is kept at an uniform height: I I, are the inlet valves, which are covered by suitable bonnets on the plate, B, which may readily be removed in the event of any derangement of the valves. The water, forced by the pumps, passes up through the outlet valves, K K′, into trunk, L, from which it is conveyed by pipes, to its destination. The trunk, L, also sustains the beam, M, from which the pump-buckets, N N′, are worked, together with guides to maintain the parallelism of motion of their rods; all well understood, being in ordinary use. The action of the pump is this; during the upward stroke of the bucket, N, the water contained in its cylinder, above it, will be forced through the passage at the top, up through the valve, K′, into the trunk L; while at the same time, a vacuum will be formed, below the bucket, N, causing water to flow in by the suction-valve, I, from the vessel, G, below. While the up stroke of N is taking place, the down stroke of N′ is effected; the water contained in the cylinder below it, being forced by the channel, E, in communication therewith, up through the outlet valve, K′. The suction of the cylinder, A′, is also simultaneous with that of the other cylinder, A, by the passage, E; which, by reference to fig. 2, it will be seen, is in communication with the valve, I, thus the valve, I, serves, simultaneously as the inlet or suction-valve K′, as the delivery valve. Again, during the up stroke of N′, and the down stroke of N, I′ will be the suction-valve for both, and K the delivery valve.

Hatching Salmon.

At one of the late sessions of the Academy of Sciences, Paris, M. Coste took occasion to remark to the society that he had succeeded in hatching salmon and trout from eggs brought from a distance. He exhibited a glass globe, half-filled with water, with a bed of sand at the bottom. A multitude of reddish, half-transparent creatures, were darting with extreme vivacity from one side of the bowl to the other. Each one was about as big as a hemp-seed. Two almost imperceptible black points seemed to be the eyes, and a slight, though remarkably active excrescence, the tail. The eggs from which these embryo salmon were produced, were sent to the College de France from Mulhausen, where they were packed by the engineers of the Rhone Canal. They were placed in a tin box, wrapped up in a mass of moist aquatic plants, and sent by diligence. M. Coste received them forty hours after they were taken from the waters of the Rhone, and immediately placed them in a basin through which he caused a steady current of water to flow. A few days after they gave birth to numerous hearty young salmon; their health was so good as to enable them to pay a visit to the Academy at a very early period of their existence.

Statistics of Strikes in Britain.

In 1836, the operatives of Preston, to the number of eight thousand, struck work for thirteen weeks, and the loss in a mere monetary point of view, to the town and trade of Preston, was calculated at no less a sum than £107,196 whilst from twenty to thirty thousand individuals were reduced at once to starvation. In the same year the cotton spinners of Glasgow struck for a period of seventeen weeks. The total loss to Glasgow amounted to £194,550. In 1834, the result of the combination of colliers in Lanarkshire, and the two adjoining counties, was equivalent to a tax on the inhabitants of £489,000 for a period of eighteen months, besides a loss to the colliers themselves, their employers, and others, during a strike of six months, of £189,000. In this strike it is also calculated that between forty and fifty thousand human beings were rendered destitute. By multiplying these figures by 4·85, we will have the amount in dollars and cents. Trade strikes have always proven injurious to the country in which they have occurred.

Curious Effect of Trying a Cannon.

On a recent trial of four 56-pounders, at the arsenal at Woolwich, Eng., one gun went off before the rest and burst, and a piece struck the gun beside it and turned it round so as to point in the direction of the town, when off its ball went, scaling the chimneys in fine style. By good fortune no person was hurt.

Poisonous Adulterations in Cider.

In consequence of the sickness of numbers of people in a quarter of Paris where cider is much used as a drink, an inquiry has been instituted, which has lead to the discovery that sulphate of lead is put into the cider, to make it clear and sparkling.

News from California represent the Mormons at the Great Salt Lake to be in a state of independent uproar; that is that they have declared their independence of the United States. We wonder who can believe all the thousands-and-one stories which are afloat about the Mormons.

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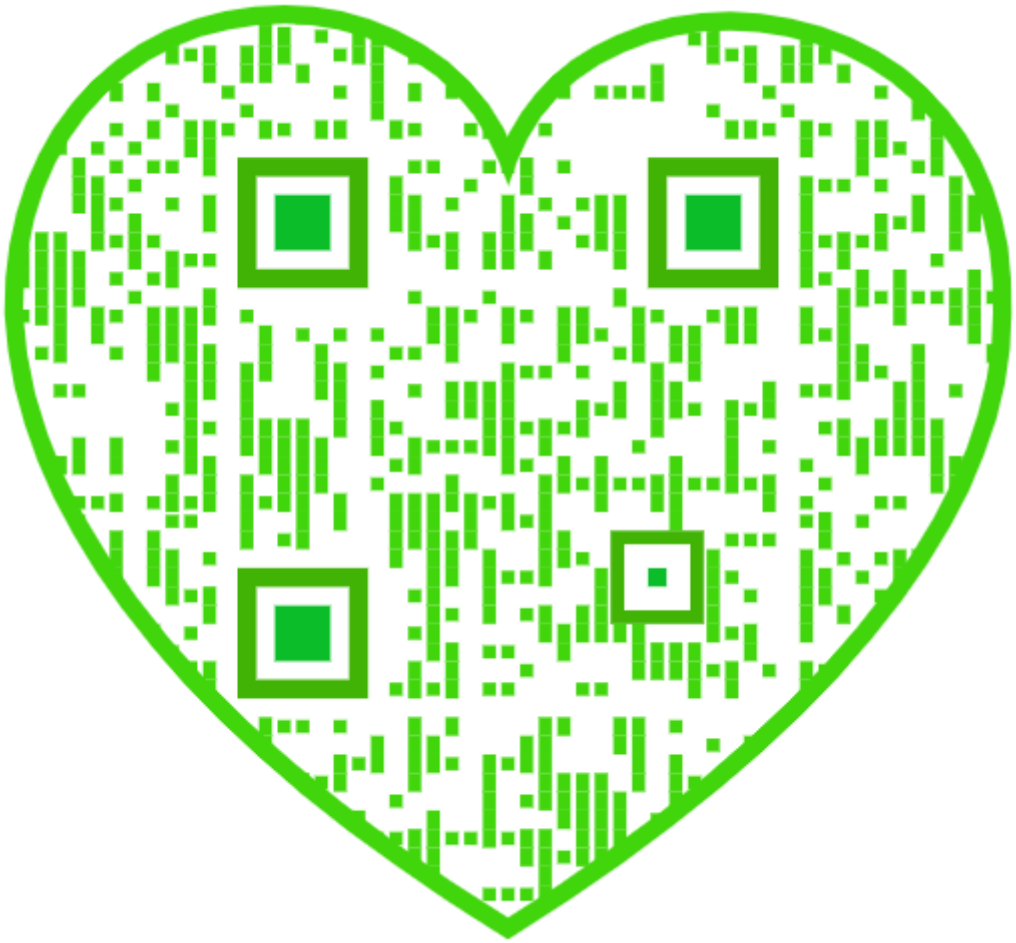

MISCELLANEOUS.

(For the Scientific American.)

Geology of the Lead Mines.---No. 2.

At points on the Wisconsin, the Blue Limestone is very thin, and in many places entirely wanting. The upper magnesian rests on the sandstone, which is about forty feet thick, and that rests upon alternations of magnesian and sand stone. One hundred and eighty feet underneath these is the lower magnesian rock, one hundred and ninety feet thick, disappearing under the river, and fully developing itself at Prairie du Chien, two hundred and thirty feet thick, resting on sandstone. It will thus be seen that this district is on a secondary formation—that we are under the coal—that we are in an upper strata of lead bearing rock, and separated from a lower one by from 50 to 200 feet of blue lime and sandstone, and that the lower magnesian limestone is thicker than the upper, and nearer the primitive rocks; consequently, there is every reason to believe that the heaviest bodies of mineral are yet below the range of our present surface mining. And these mines, so far from being exhausted or "petering," cannot be said to be opened, when compared to the depth to which mining is carried in England.

Mining, in no instance, has ever been carried here to a greater depth than one hundred and twenty-five feet; the usual depth is from thirty to seventy. Yet have these mines produced, in the last ten years, six millions two hundred sixty-nine thousand pigs of lead, weighing forty-three millions eight hundred and eighty thousand pounds, which have been sold for upwards of thirteen millions of dollars.

The State of Illinois has appointed, as Geological Surveyor, Dr. Norwood, who, we believe, was formerly associated with Dr. Owen in a partial survey of Wisconsin. He is fully competent to fill his appointment. We would like if our friends in Wisconsin, could be induced to give Dr. Owen a similar one, and thus procure a full and detailed account of the mineral wealth of that State. Should they do this, and a simultaneous survey be made of the district to which this brief and partial sketch refers, we feel well assured it would be the best expenditure ever made by the State.

When we consider the manner in which mining is carried on in this section; the inconsiderble depths to which our shatts have been worked, and the amount ot mineral produced; we are compelled to admit the correctness of the opinion expressed by Doctor Owen, in 1840:—"This lead region is decidedly the richest in the known world." It is true that the produce of our mines is not now as great as it was in 1847, when the amount shipped was fifty-four million of pounds of lead, and it is also true that there has been a gradual decrease since. But this is not owing to deterioration in the productiveness of our mines, but to a number of causes, that have operated against this kind of productive labor.

We are aware that one class of persons attribute the decrease in the quantity of the lead now made, to the political scape-goat that bears the accumulated sin of decline, in all the productive and manufacturing interests ot the nation—the Tariff. Another to "scarcity of mineral," or, in other words, unproductiveness in our lodes. Neither of these, do we think, is a correct view of the case. The first proposition we turn over to the editor of the New York Tribune; the second we say has no foundation, and we do not hesitate to assert, and the facts will bear us out, that there are new lodes opened within the last nine months, producing as much or more mineral than any heretofore worked. Levin's, Potwine's, Comstock's and Turner's lodes are referred to. But it is to causes other than these, that it is due. One is, that the mineral lands and the system of mining, has changed since 1847. The lands from being the property of the Government, (we might with truth say the public) have passed, by purchase, into the hands of individuals. Formerly a miner could range through the whole extent of mineral region, and wherever he found a piece of 'vacant ground,' commenced 'prospecting.' Should he, after a few day's labor, find 'gravel mineral,' or other indications of a 'good prospect,' he continued, if not, he shouldered his pick, shovel and rope, and sought a more favorable location. Numbers of persons were then mining, who 'farmed it' during three-fourths of the year, in the adjoining counties, and visited the mines in winter, to 'make a raise.' The 'sucker holes,' in all parts of the mines, were the work of this class; and a very large amount of mineral was thus 'raised' and thrown into market. This source has been entirely cut off.

The 'prospector' has abandoned the field and left his vocation to the regular miner; very many of these last, since the discovery of gold in California, have left our mines. The occasional return of an old lead miner, with an amount of gold, that at best is but a fair compensation for time, expenses and privations, incurred during his trip, has had its influence, and induced others to seek the land of promise, and abandon a certainty of at least a comfortable living, for the chance of a fortune in California. These are among the true reasons of decline. We are only in want of three things to raise our standard of productions far above any point which it has yet reached: they are capital, coal, and miners. The first is slowly but surely accumulating among us. The second, if ever the Central Railroad gets into operation, crossing, as it will, the Great Illinois Coal Field, will be enabled by the trains, to furnish us with any amount of coal equal to the demand, at prices that will enable us to work our mines as they do in England—make machinery supply our deficit in manual labor. Situated as we now are, our mining may be compared to unaided individual labor, as contrasted with that of united effort, combined with capital. Here we mine at depths nowhere exceeding 125 feet, and there is no single adit in these mines, 500 feet long, neither will the combined excavations ot shafts, drifts, or levels, in any mine that we know of, reach 1,000 feet. Now, compare these facts with what is done in the same department of industry in other lands. The engine shaft in the United and Consolidated mine in Cornwall, reaches a depth of 1,650 feet; the length of the combined excavations reach sixty-three miles. The mine of Valencia, in Mexico is 1,860 feet deep. The Sampson mine in the Hartz, 2,197 feet. A mine near Freyburgh, in Germany, 1,944. In an article published last July, in the Mining Journal, London, the writer, in discussing the formation of mineral lodes, says:—"Are there mines worked in Cornwall profitably beyond six hundred feet?" I answer yes; and give him the names and localities of twenty-two paying mines, all of them are six hundred, and many of them are over twelve hundred feet deep. In mine Wheal Vo, they had a smithery 1,080 feet below the surface. In the Dalcoth mine, the engine shaft is fifteen hundred deep. Compare these with our mines, and how insignificant do [illegible]rs appear. But not so our products: for in these we are far ahead of any yet opened. We have not a single steam engine in operation on any mine in our district. A single horse, or at most two, employed in pumping, is all that can be found with us. The first steam engine employed in mining, was in Cornwall, between 1710 and 1714; now, according to accurate returns and estimates, the steam power employed in mining in Great Britain is performing the labor of seven hundred and fifty thousand men.

Give us cheap fuel, let the iron horse bring us coal from the bed that we know to be inexhaustible; then will commence a new era in our mining; with the steam engine at work upon our lodes, we will see our staple increase, with far more rapidity than it has declined.

E. H. B.

Galena, Ill.

Academy of Sciences in Paris.

Lord Brougham recently read at the Academy, before a most crowded auditory, a paper on the optical and mathematical inquiries which have occupied his time during his late residence at Cannes. His lordship accompanied the reading of this memoir with numerous demonstrations on the board, and for upwards of an hour occupied the attention of is hearers. MM. Arago, Biot, Tenard, and other eminent scientific men were present, and appeared deeply interested in the explanations of their learned *confrere.*

Copyrights and Patents.

"In reference to copyright, it has long been extended to twenty-eight years, with the right of renewal for fourteen years longer. This was found necessary to give adequate protection to authors, and ought not to be denied to inventors, for they have been at least as useful to the country."—[C. M. Keller on the Woodworth Patent.

The above enunciation of a doctrinal point in law, demands the scrutiny of those who have studied the principles of law. Mr. Keller is a lawyer, and has been admitted to practice in the United States Courts. The same doctrine, with additions, has been propounded before, by a lawyer, too, in the American Institute. If lawyers are not acquainted with the principles of law, they should be, and if they are ignorant of them, where shall we look for correct information on the subject. It is a fact, however, that many of our lawyers are not acquainted with the principles of jurisprudence, but merely with the practices of courts, and have a knowledge of arranged facts—the laws as printed, and decisions rendered in disputed cases. This knowledge, useful and necessary though it be, is not enough to make a counseller of the first quality, because a knowledge of principles is the only kind which enables a lawyer to make true comparisons—draw correct similies. The absence ot this knowledge is evident in the extract from Mr. Keller's long document on the subject of the Woodworth Patent Renewal. There is no similarity between a patent for an improvement on machinery, and a copyright for a book. Speaking scientifically, if the conditions of the *two rights* (copyright and patent) were the same, the comparison would be correct; but the conditions of the two *rights* are radically different. The value of a copyright depends much on the style of the author—which no man can imitate. A historian may write a history to-day, and secure it by copyright, another may write one next year and use all the facts in the other history, and yet the copyright of the first would not be violated in the eye of the law. We have "Marshall's Life of Washington," and "Sparks Life of Washington;" we have "Hildreth's History of the United States," and "Bancroft's History ot the United States,"—both are copyrights, but does one infringe the other? No; the law of copyright allows free scope to literary genius, and shackles it not. Would Mr. Keller be willing to allow the Woodworth Patent to be tested by the law ot copyright? I trow not; for two authors may get up books essentially alike, and get them copyrighted on the same day, and yet the one would not infringe upon the rights of the other—the two would be allowed to sell their books for the twenty-eight years. But is it so with patents? No; patents sometimes do great injustice to some men, for two inventors may invent a like improvement unknown to one another—they may be living a thousand miles distant, and yet the one who can prove that he made his invention seven days—yea, one day—before the other, in the eye of the law, is entitled to the patent, and receives it. The other inventor is, by this law, deprived of the use of his own invention for 14 years—it is a great injustice to him, but it is an act of national policy, and one which was enacted for the encouragement of art and science; such an act of injustice could not be perpetrated in the case of a copyright.

Mr. Keller, in his zeal for his client, makes a comparison which is wrong in essence and principle, as one to guide us in deciding on the principle of a patent for an invention. The very nature and use of an invention, too, is radically different from that of a book. An inventor may use his invention in secret, and do a most profitable and extensive business, but a book is the thing produced—it cannot inure to the benefit of the author by any secret use—not even the copyright ot a play, for the value of it depends on its popular effect. If there were no patent laws at all, no man's natural right would be invaded, for every man could use his own improvement profitably in secret; but it would be far otherwise with the book of an author.

It is well known to the Patent Office, and no doubt to Messrs. Munn & Co., and C. W. Keller, also, that two, three, and four inventors, have applied for patents about the sam time, all for the same thing, and that the patent has been granted to one of them because he proved to be a little in advance of the rest. The invention as a natural right, belonged to each one, for it was the creation of his own mind, and was reduced into practice by his own hands. Our patent laws are not founded in equity altogether—they are laws of policy, and, as such, I think highly of them; but the conduct of Mr. Keller, and the heirs to the Woodworth patent, if persisted in, will, I have no doubt, be the means of abolishing them entirely in less than twelve years from the present date. The New York Daily Times advocates this now. Inventors and patent attorneys should be exceedingly careful not to be too exacting; such conduct, in the working of events, generally defeats itself in the end.

Junius Redivivus.

Cause of the Burning of the Amazon.

Lord Dundonald has written a letter to the London Times, in which he ascribes the melancholy loss of the Amazon to the over-working of the engines and the boilers, for the purpose of effecting a superior passage. The heat thus generated had evolved resinous gas from the new pine planks, and hence the disaster.

The opinion ot Lord Dundonald is worthy of great consideration. He is one of the most shrewd, observing, and ingenious men in the world.

A Good Water Wheel.

Messrs. Editors—We are using a grist mill, the stones being 30 inches diameter, driven by an iron wheel 35½ inches diameter, using less than 60 inches of water under a head of 10 feet and 2 inches, that grinds 20 bushels of oats, or from 10 to 15 bushels of corn per hour. The mill is from the works of J. H. Burrows, of Cincinnati. The wheel is not under the influence of a patent, so far as I know. No mill in this vicinity, that I know of, will grind so fast or any better.

D. Edwards.

Little Genesee, Albany Co., N. Y.

Wreck of the U: S. Steam-Frigate Missouri, at Gibraltar.

A letter from John E. Gowan, Esq., the contractor for removing the remains of the U. S. steam-frigate Missouri, dated Gibraltar, Jan. 14, states that all the machinery has been removed, except the shafts, which would be taken out in the spring. The light which has been kept for eight years over the wreck has been dispensed with. He further says that he did more in three weeks in removing the steamer than the English accomplished in three years.

Hobb's Locks.

The triumph of Day & Newell's lock is complete. It is said there is a great demand for the locks in England, and that Mr. Hobbs remains in London as a permanent agent. Not only has the lock been placed upon the vault and doors of the Bank of England, but the British government are negotiating with Mr. Hobbs to have these locks put on all the public vaults throughout Great Britain; and furthermore, that of all the locks exhibited at the World's Fair, most, if not all, supposed to be invulnerable, this was the only one that was not picked.

An English paper states that "Mr. Hobb's was in Liverpool a few days ago, and picked the lock of Mr. Wm. Brown's safe, by way of experiment, in a few minutes." At a meeting of the Liverpool Architectural and Archæological Society, the Secretary stated, in reference to Mr. Brown's lock, that Mr. Hobbs had not intended to pick it, but that he had unintentionally done so while he held it in his hand.

Dr. Kane's Lectures.

Dr. Kane, who accompanied the Grinnel Arctic Expedition in search of Sir John Franklin, delivered his two lectures in this city last week. They were well attended and gave great satisfaction. Dr. Kane is one of the most extraordinary men our country has produced. He is firmly of the belief that Sir John Franklin may be safe and thinks another expedition should be sent out from our country In our opinion it would do no good, although it would be chivalrous. Mr. Grinnel has offered his vessels to government for another expedition.

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Woodworth Patent Monopoly.

Charles M. Keller, Esq., the agent who got the re-issue of the Woodworth patent, and who has been, and still is, in the employ of the heirs and assignees of the said patent, has presented to the Committees of Patents in both Houses of Congrees, arguments in favor of extending, by special Act of Congress, the said patent for fourteen years. This argument was published as an advertisement in the Philadelphia Ledger of the 23rd Feb., ult. This argument demands our attention, because it presents views wrong in principle we believe, from those we advocate, and statements are made which deserve the censure of all upright men. We have no personal interest to subserve in speaking for or against the extension of this patent, we keep ourselves from entangling alliances, so that we are able always to speak those sentiments freely which, in our opinion, are just in the sight of God and man.

The paper of Mr. Keller sets out with asserting, as broadly as it possibly can, that William Woodworth was the first man that planed and matched plank by machinery—that he was the first man who did away with planing, tonguing, and grooving by hand labor. This is not correct. Let any of the members of the Committees on Patents read Reese's Encyclopædia (article Planing Machines) and he will discover that old Gen. Bentham, in 1791, took out a patent for planing boards by machinery. He did not use a cylinder with cutters, but he did use pressure rollers in his plane, as near as possible to the cutting edges, and "these rollers," the patent says, "were employed to keep the board from springing." The combination was not the same as that of the Woodworth patent, but the idea—the evil to be overcome in planing the boards by *pressure*, belongs to Bentham, there can be no doubt of that, and it is now public property by the divine right of justice. In 1802 Bramah took out a patent for placing his cutters on a revolving vertical, and also on a revolving horizontal shaft. (See same work.) In 1803 (same authority) Mr. Bevans obtained a patent for planing all kinds of mouldings, plowing grooves, &c., by machinery. It would be wrong for us to endeavor to speak evil of William Woodworth, we esteem his memory as much as we do that of any other good inventor, and that is a great deal, but at the same time to give him the credit which belongs to other inventors, is very wrong.

Mr. Keller's paper pays a high compliment to William Woodworth; it speaks sympathizingly of his sufferings, and proudly of his achievements. We have never said a word against the memory of William Woodworth; the upright, generous, and unselfish, will always tread softly on the graves of the departed. We are sorry to say that when Mr. Keller gives vent to the gushings of his sympathy for the sufferings of the deceased William Woodworth, he makes a most brutal attack upon the deceased Emmons, a cotemporary inventor with Woodworth, and one who disputed successfully with him for priority of his invention. He spares not the dead, but calls Emmons a tool, and his efforts a fraud, thus stabbing his memory and outraging the feelings of an old man—the father of the deceased—now fast approaching the end of life. Oh, this is wrong, inhuman. Mr. Keller charges Emmons with fraud—the same charge has been brought against the re-issue of the Woodworth patent. A jury in Baltimore decided, that the re-issue was not the same as that of the original patent. It is well known that the original drawings and specification did not describe nor illustrate the claims of the re-issued patent. The Hon. Edmund Burke has admitted this, but it is said that, in 1829 (this was after the patent was granted) a model was deposited in the Franklin Institute, and Judge Harris, of Albany, has testified that Emmons declared, before he died, that he acted fraudulently. Very little confidence should be placed in testimony against any deceased person, for the dead cannot confront the living. Why did Judge Harris not bring out the truth when Emmons was living?

Mr. Keller presents part of the address of Judge Kane, delivered before the Franklin Institute. We have a few words to say about that address; some of the remarks are altogether unworthy of a man of his education fame, and position. We consider that the rights of one inventor are just as sacred as those of another, and although the address of Judge Kane exhibits a great sympathy for inventors, no Judge, and we say it with all respect, has done more injustice to some inventors, by his decisions, than he. It is well known that if a thing has been in use for a number of years without being claimed, it becomes public property. Now, if William Woodworth did not claim what his heirs have claimed, for 14 years after it was in use, it surely becomes public property, yet Judge Kane has decided, in the Woodworth case, that it did not; and then, again, in the Battin case (see the last number of the Franklin Journal for his charge), he did. In the Bain case, he also, we believe, did great injury to a meritorious inventor and patentee.

There are some men who make a great noise about the rights of inventors, in speaking about such a case as the Woodworth patent. We oppose it, because that patent, in the hands of a monopoly, has been used to injure poor and worthy inventors. It is quite a common thing, when a poor man gets out a good improvement, for an old patentee in the same line, if he be rich (although the improvement is as different an invention from his old patent as the engine of Watt to that of Hero). to give notice that if he does not stop running it he will be sued. The great majority of the law suits, in connection with the Woodworth patent, have been brought against inventors—men who received patents for improved planing machines, which we believe, and which they believed, were entirely different in principle from Woodworth's. The address of Judge Kane was delivered shortly after a trial of Wilson against Barnum. The latter got a patent: he used no pressure roller nor cylinder, and yet an action was brought against him for infringement of the Woodworth patent. We published an engraving of this machine in Vol. 4; we took the ground that it was a different machine—no infringement. Judge Kane said it was; but a jury trial was the means of lifting Judge Kane's injuntion; (the jury disagreed—one being in favor of Woodworth).

Monopoly grants impede the progress of improvement. The Woodworth Monopoly is so powerful that every inventor is afraid of it, because he knows that if he should invent a planing machine, altogether different and better than the Wood woorth one, he would not dare to run it: he would be threatened with a law suit at once. We state a positive fact—we speak for inventors, their rights, and those of Society. Does anybody hear of the Barnum Planing Machine now? No. It was found that no good and just mechanician could testify to a similarity between it and Woodworth's, and an arrangement was effected with the patentee,—yes, an *arrangement*. This monopoly has been able either to frown down or buy up the interests of nearly all opponents. In speaking thus. we state only a public fact: it is certainly no good sign to see this.

Recent Foreign Inventions.

BITUMEN FOR PIPES AND WATER WAYS.—Thomas, Earl of Dundonald, (Admiral Cochran, so famous in story as a hero and inventor), has taken out a patent in England for the following applications of bitumen:—

"The new material proposed to be employed for the various purposes enumerated in the title, is the bitumen, petroleum, or the natural pitch of Trinidad and the British North American Colonies. Of this substance there are several different varieties, it being found more or less indurate and elastic in different situations. According to the character of the article to be produced, and the nature of the use to which it is to be applied, so must a hard or soft, elastic or non-elastic bitumen be selected. The articles are formed by running the bitumen in a melted state into suitable moulds, using a core as may be required, and care must be taken that the mould and core are covered with clay, black lead, or some other substance, which is capable of preventing the bitumen from adhering to the same. When casting pipes for the conveyance of liquids, it is preferred that they should be flattened on one side, to enable them to remain firm and steady in the position they may be intended to occupy. Instead of casting pipes they may be manufactured by bending strips of sheet bitumen around a core, and then melting together the abutting edges, or running liquid bitumen in between them. For the purpose of lining cisterns or such like receptacles, sheets of bitumen are prepared by rolling or pressing out lumps of that substance, and the meeting edges of the sheets are to be united together by melting or by the use of liquefied bitumen. Sheets of textile fabrics of a loose and open texture may be also coated, on one or both sides, with bitumen; to facilitate which operation, they should be previously saturated or paid over with liquid bitumen, or bitumen dissolved in naphtha. These sheets are very suitable for being used to cover ships' bottoms, between the planking and the metallic sheeting; and they are also adapted for other uses where substances impervious to wet, and almost indestructible are required.

Another application of bitumen is for the purpose of covering electric telegraph wires. The wires may be either covered separately (and when this is done, it is preferred to enclose the wire previously with some filamentous material saturated with liquefied bitumen), or a rope having been covered with bitumen, and longitudinal grooves left in the coating for the wires to fall into, they are laid in the grooves, and the whole covered with another coating of bituminous material.

The inferior descriptions of the same material may be also employed for consolidating rolling gravel, forming foundations, or supporting those in a falling condition, lining sewers, water-ways, &c.; and its application is suggested in the colonies for lining the beds of copious streams which flow from the mountainous districts during certain seasons, for the purpose of conducting the water, which otherwise generally runs to waste, or is absorbed in the bed of the river, to situations where its fertilizing influences will be most beneficially applicable. The bitumen lining may be applied by covering the surface of the bed of the river with the material, and then fusing it by burning brushwood, which is to be spread over for thatpurpose.—[London Mechanics' Magazine.

[For the Scientific American.]

Brick Machines.

Some months ago I was on the point of addressing you a letter suggesting "Something to be Invented," as I have seen occasionally in your paper, and call your attention to that which heads this article. The Patent Office has a case full of models for this purpose, but they all deal in the two extremes: either to work the dry clay or the soft mud. With the first I have had two years' experience, and have furnished several millions of brick to the Government at Norfolk, Pensacola, Washington, and Annapolis; besides supplying some of the finest buildings in this city. If made of the proper material, and well burned, the bricks are stronger and better than those made in the ordinary way; but it requires an immense pressure, mine is estimated at 100 tons to the brick, and consequently demands heavy and expensive machinery.

The soft mud is limited as to the season of operation, is subject to the vicissitudes of weather, and unless moulded with care by an experienced hand, is rough and misshapen; the stiffer and more tenacious the clay is prepared, the better the brick; but a man has not sufficient strength to fill the mould, and if he had, the brick will not slip. Therefore the front brick mould is made to open with a latch,—hence the name, and thus frees the brick.

It occurred to me that if the clay could be worked as stiff as it is upon a potter's wheel, it would be the perfection of the art. I have recently directed my attention to the subject, and accomplished what I think has never yet been attempted, that is, moulding bricks of potter's clay by machinery. Those of the profession here who have examined the model say they have no doubt of its success.

The clay is taken from the bank, passed through the pulverizer, which converts it into dust, thence into the temperer, where it receives a jet of water from a pipe, and a rill of coal dust from a shoe and hopper—the whole thus incorporated into the proper consistence passes into a box or receptacle, beneath which a train of moulds are filled, six in one frame, moving on a rail-way. As these appear in front (a copper strike planishes the surface) the bricks are lifted out of the moulds, each on a separate iron plate, on which it is borne to the floor, and there set on edge to dry. It is evident that by this process the bricks must necessarily be as square in the corners and edges and otherwise as true as the latch brick. There being no cold clay to handle, operations can begin two or three weeks earlier in the Spring and continue as much later in the Fall. In five minutes the machine can be set for front bricks, by introducing another set of moulds made a quarter of an inch deeper;—from these the bricks, being first rubbed in dust, are taken to the ordinary hand-press and thence to the shelves, until they are ready for the kiln.

The cost, including the right, will not exceed $500,—it will mould 15,000 per day, and a six-horse engine will drive two of them.

FRANCIS H. SMITH.

Statistics of Coffee.

The coffee of Arabia is a native of Abyssinia, where it is found both in a wild and cultivated state. It was brought from thence to Arabia in 1450. In a century its use extended throughout the Turkish empire, and soon found its way into Europe. The coffee produced in every part of the world at the present time is as follows:—

Brazil - - - -	176,000,000 lbs.
Java - - - -	124,000,000 "
The Phillippines - -	3,000,000 "
Arabia - - -	3,000,000 "
Celebes - - -	1,000,000 "
Cuba and Porto Rico -	30,000,000 "
Laquira and Porto Cabello	35,000,000 "
British West Indies -	8,000,000 "
French and Dutch West Indies	2,000,000 "
Malabar and Mysore -	5,000,000 "
St. Domingo - -	35,000,000 "
Ceylon - - -	40,000,000 "
Costa Rico - - -	9,000,000 "
Sumatra - - -	5,000,000 "

Showing a total of 476,000,000 lbs.

New Method of Preparing Negative Photographic Paper.

M. Gustave Legray, in the "Moniteur Industriel," describes, a new process for preparing negative photographic paper. He takes virgin wax, and keeps it in a large flat vessel at 100°, centigrade, and immerses the paper in this until it is well saturated. The sheet of paper is then withdrawn, and laid between several pieces of blotting paper, over which a moderately heated iron is passed, which causes the paper to absorb the superfluous wax. If the paper were properly prepared, there will be no gloss whatever on the surface, and it will be perfectly transparent. The waxed paper is then immersed in a warm solution composed as follows:—1,000 parts of rice water; 40 parts of sugar of milk; 15 parts iodide of potassium; 0·80 of cyanide of potassium, nnd 0·50 of fluoride of potassium. The sheet of paper should be laid in this solution for half an hour, and it may then be withdrawn and hung up to dry. It is then immersed in a clean solution of acito-nitrate of silver, which is thus formed:—300 parts distilled water, 20 parts azote of silver, 24 of crystalizable acetic acid, and 5 of animal charcoal. The animal charcoal serves to render the paper more susceptible to receive impressions. The paper remains three minutes in this solution in order to insure contact with the solution; the two sides of the sheet should be rubbed over with a brush. The paper is then washed several times with distilled water, and then well dried between pieces of blotting paper. This paper may be kept in a dark place for more than a fortnight, without undergoing any alteration. After this paper is subjected to action in the camera, it is run through a solution of 1 part gallic acid, 0·5 of azote of silver, and 200 parts of distilled water, and the image is fixed by the hydrosulphite of soda.

Our Advertisements.

The advertisements in the Scientific American are excellent references to those who wish to purchase the articles advertised. This page is valuable to our readers, as it gives many of them information respecting where they can get those articles they require. Our advertisements are of a peculiar class, and those who wish any of the machines or articles noticed there, should correspond with those who advertise.

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NEW INVENTIONS.

Improved Ships' Hank.

Mr. Samuel Barker, of this city has taken measures to secure a patent for an improved Hank, which is employed to secure the sails of vessels, each to its proper stay. The hank is a hoop divided into two equal parts and connected by a joint; the hoop on the side opposite the joint has a socket attached to it, which is also divided into two parts, one being attached to each part of the hoop, so that when the said hoop is distended, the socket is opened. Friction rollers or rings are placed upon the hoop for the purpose of diminishing friction and preventing the wear of the stay. The hoop is placed around the stay by distending the ends which have the parts of the socket attached to them: the two parts of the socket are then brought into contact and secured by a screw which has a ring on one end. An eye of a circular form fits in the eyelet of the sail, and it has a shank which is secured in the socket of the hoop by a screw rod. The eye and shank are composed of two parts connected by a pivot, by which the eye may be opened and placed in the eyelet.—There are a number of hanks to a sail, and they are employed to secure the sail properly to the stay. When the sail is raised or lowered, the hanks traverse the stay. Every person who sails a boat, schooner, or any vessel which carries a sail, will find this hank to be a good improvement over the common hoops now employed for furling and unfurling angle sails.

Letter Printing Press---The Typographer.

On page 166 (this Volume of the Sci. Am.) we published a letter from Mr. John Jones, of Clyde, Wayne Co., N. Y., which was sent to us as a specimen of a letter produced by a new printing press—it was a sample of printing by machinery, the press being a substitute for writing with a pen. In that letter Mr. Jones stated that he had devoted his attention to the subject some years ago, but gave it up almost in despair. His attention was again directed to the subject by our calling for "an invention wanted—a convenient machine to print letters, as a substitute for writing." This resulted, he states, in the discovery of the true principle of action, to make it work successfully; and, in truth, it is a most valuable invention. Mr. Jones has taken measures to secure a patent; we have seen his model, and feel proud and pleased with it. It can print a letter faster than the majority of men can write one with a pen, and we wish that one was in every family. The machine is simple and not expensive. Since the first one was constructed, Mr. Jones has received many applications for machines, and we have no doubt but he will yet reap, as he should, a rich reward for his studies and labors. This invention is an evidence of the great good of a paper devoted to invention and mechanics, by directing the attention of inventors to particular subjects.

Rifled Cannon.

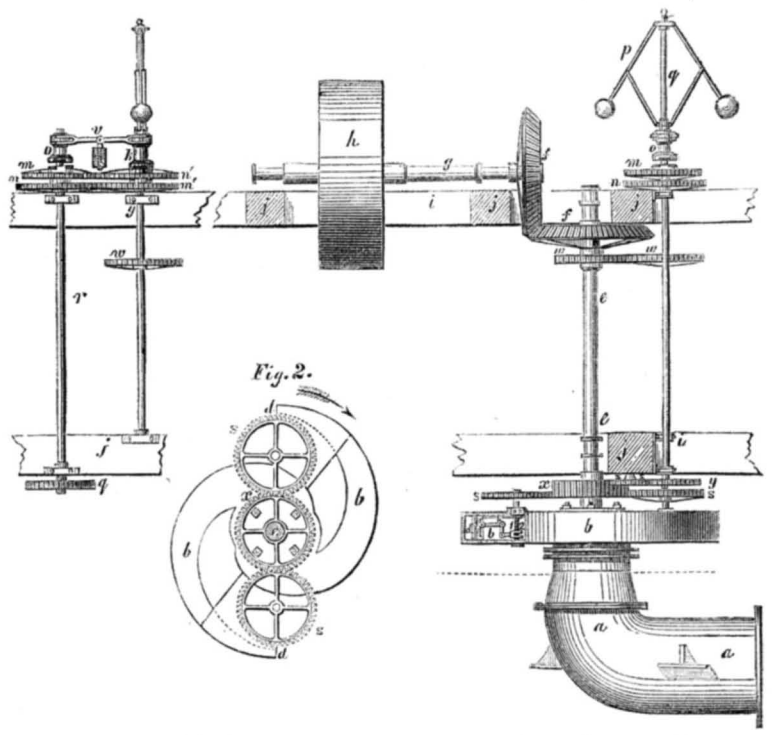
A nine-pounder field battery gun has been grooved at the Royal Arsenal, England, on the rifle principle, and experiments will shortly be made with it to ascertain its merit compared with the usual nine-pounder field battery gun, when charged with spherical shot. The four grooves in the cannon are about half an inch deep by half an inch broad each, and the shot and shell intended to be fired from it are made of the cylindro-conical or sugar loaf shape, with four projecting parts on each to enter and fill the grooves. Both shot and shell are galvanized, and so smooth and not liable to rust by that process that they may be rammed home with the greatest ease, the simple pressure of the hand being sufficient to place them an arm's length into the mouth of the cannon, although they are made to fit more full than the spherical shot does, and consequently they will have less windage and require a less charge of powder. The sugar-loaf shape of the new galvanized iron shot renders it of a far greater weight than a nine pounder spherical shot; and the principle on which it will proceed after being fired from a rifle cannon, being similar to an arrow, instead of revolving in the same manner as spherical shot, is expected to cause it to go more direct to the mark, and to have a much longer range.

Tubular Tunnel.

M. Horeau, a Paris architect, proposes to lay a railway in the bed of the sea between England and France. The road is to be enclosed in a tube similar to that which crosses the Menai Strait—and, if we understand the particulars, the tube is to be fastened down in its bed by huge iron pins at intervals of a mile throughout the twenty-one miles of its submarine course—which pins will perform the further service of carrying lights on their heads at night to warn ships against anchoring over the railway. M. Horeau estimates the cost of the scheme at fourteen millions sterling.

FINLAY'S PATENT DIFFERENTIAL GOVERNOR.

Figure 3. Figure 1.



The accompanying engravings illustrate the Differential Governor of Mr. James Finlay of Cold Spring, Putnam Co, N. Y:—

Fig. 1 is a side elevation of the governor as applied to Whitelaw & Stirratt's patent water wheel. Fig. 2 is a plan of the gearing on the top of the water wheel, in connection with the governor; and fig. 3 is a front elevation of the governor, apart from the water wheel, and for a view of the wheel in full, see page 208, Vol., 6, Scientific American.

b b is the water wheel; *d d* is the jet apertures; *a a* the main pipe; *e* the water-wheel shaft; *f f*, the main gearing, by which the power is transmitted to the main shaft, *g*, and drum, *h*, and from thence by a band to any machinery on which it may be intended to act. *i i* and *j j* are parts of the framing. *p* is a revolving pendulum, mounted on a spindle *q*, which in the view shown, fig. 1, is situated beyond a second spindle, *r*, as seen in fig. 3, and is supported by a step on the upper edge of the lower frame at *i*. This spindle is driven from the water wheel shaft by the cog wheels, *w w*, and carries cog wheels, *m' n'*, of different sizes, which gear into two similar cog wheels, *m n*, on the spindle, *r*. These wheels are reversed in position, so as to have the smaller on the one spindle, to gear into the larger on the other. *n'* and *n* are keyed fast; *m'* and *m* are loose, but are capable of being engaged by the clutch boxes, *o* and *k*; the prongs of the latter being sufficiently long to engage *m'*, by extending down through betwixt the arms of *n'*. This clutch box is connected by links to the arms of the revolving pendulum, so as to be drawn upwards or pushed downwards, in accordance with the centrifugal action of the balls, consequent upon the variations of motion; and it is also connected with the clutch box, *o*, by a double forked lever, movable on the centre, *v*. The result of this connection being to communicate to the clutch box, *o*, the upward and downward motion given to clutch box, *k*, by the arms of the revolving pendulum. The motion thus communicated will be seen to be in opposite directions; the one clutch box moving upwards, whilst the other is moving downwards, and vice versa. *x* is a cog wheel fitted loosely to a turned seat on the shaft *e*, so as to be at liberty to revolve freely round independent of that shaft. It is connected through an intermediate stud wheel, *z z*, with a wheel, *y*, which is keyed fast on the bottom of the spindle, *r*, and consequently must partake of any variation of motion that may be given to that spindle. *s s* are cog wheels which gear also into, *x*, below *y* and *z*. These wheels are mounted on short spindles, which revolve in bearings attached to the water wheel, and have screws formed on the lower end; one of which is seen at 2, fig. 1. On this screw there is a nut with two projecting ears, which are embraced by the forked end of the horizontal arm of the bell crank, 1; the vertical arm of which is connected by the link, 4, with a movable adjusting plate, which forms the inside of the jet aperture at *d*. It will now be obvious, that if the cog wheel, *x*, be made to revolve in either direction the wheels, *s s*, with their spindles, will revolve accordingly; and by the action of the screws, the nuts held by the forked ends of the bell cranks will either ascend or descend, in accordance with the direction of the motion given to *x*, and will act on the adjusting plates through the agency of the bell cranks and links, so as either to push them outwards, and diminish the width of the jet apertures, or draw them inwards and increase that width.

Such being the general arrangements of the parts of the governor, its action may be thus explained:—Assuming 37 revolutions per minute to be the proper speed of the water wheel, and also the proper speed for the revolving pendulum; let it be supposed that the water wheel having been put in operation, is making 37 revolutions per minute; it will transmit the same speed to the spindle of the revolving pendulum through the equal sized cog wheels, *w w*, and draw up the clutch box, *k*, and also the double forked lever in connection with it, to the exact position at which they will stand under those circumstances. But by the same action the fork on the opposite end of the lever will push down the clutch box, *o*, on the spindle, *r*, to a corresponding distance. In this state of things the lever is supposed to stand in a level position, holding both clutch boxes out of gear with their respective loose wheels, *m'* and *m*, as represented in fig. 3. It will be obvious that no motion can in this case be transmitted from the spindle, *q*, to the spindle, *r*, and consequently no motion can be transmitted to the wheel, *x*. So long therefore as this state of things continues, no change can take place in the widths of the jet apertures.

Suppose now a part of the resistance to be thrown off the water wheel, the speed will then begin to increase, but the moment this takes place, the balls of the revolving pendulum will, by their increased centrifugal action, recede further from the centre of motion, and raising up the clutch box, *k*, will push down the clutch box, *o*, so as to engage the wheel, *m*. The consequence will be, a speed transmitted through the spindle, *r*, to the wheel, *x*, as much greater than the speed of the water wheel, as the wheel, *n'*, is larger than the wheel, *m*. But the wheel, *x*, being free to move, independent of the water wheel shaft, and being driven in the same direction, will have a relative motion round that shaft precisely equal to this difference of speed. For instance, should this difference be five revolutions per minute, the wheels, *s s*, will each make five revolutions per minute, which acting through the arrangement of parts already explained on the adjusting plates at *d d*, will communicate to them an outward motion, tending to diminish the width of the jet apertures, and this action will continue until the water wheel resumes its proper speed; when the lever and clutch boxes will return to their former position, until another change of resistance calls for a renewed action of the governor.

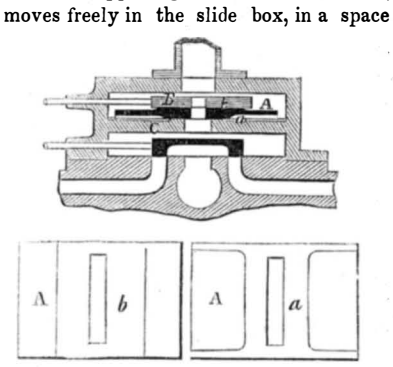
Let it now be supposed that the resistance taken off has been again put upon the water wheel, and it will be seen that an action precisely similar to what has been already described will take place, but in a contrary direction. The wheel, *x*, will then have a relative motion in a contrary direction to the motion of the water wheel, and an action will consequently be transmitted to the adjusting plates, to draw them inwards, and increase the width of the jet aperture.

The advantages possessed by these wheels, whether relating to cheapness, durability, or efficiency, are such as cannot fail to recommend them wherever they are known.—Twelve, of 200 horse-power each, have recently been furnished to the Morris Canal Company for working the machinery of the inclined planes on the Morris Canal, where they may be seen in full operation any time during the continuance of navigation.

For particulars address James Finlay, manufacturer and patentee, Cold Spring, Putnam Co., N. Y.

Cut-Off Valve.

The accompanying engraving is a section of a cut-off valve. A simple cut-off valve, moved by an eccentric, or by mechanism connected to the same, gives only one entirely correct expansion; the stroke, if altered, will let steam enter either too early or too late, and in both cases there is a loss of steam. To overcome this difficulty, it is necessary to have the operating eccentric keyed or arranged to the shaft in a right angle to the crank, which will be easily understood by those acquainted with its operation, and the additional slide valve, A, will allow this to be done. The valve, A, which is an appendage to the endless valve, B, moves freely in the slide box, in a space



equal to the width of the hole for the admission of steam, and its touching surface, *a*, upon the plane of the slide box, is one-third, one-half, or one-quarter of the surface of *b*, of A in contact with the valve, B. The touching surface between A and B being larger than between A and C, the result will be that A moves together with B until A reaches the limit of its stroke, and causes the steam communication to be always opened at the centre of the stroke of valve, B, and the engine moving back or forward, using more or less expansion, it will always give a correct admission of steam. H. A. Luttgens.

New York.

Prof. Park says there is annually preached in the United States an amount that would make 120,000,000 octavo pages.

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Scientific American

NEW-YORK, MARCH 6, 1852.

Monuments to Great Men.

On Wednesday evening of last week, a great meeting of the admirers of James Fennimore Cooper was held at Metropolitan Hall, this city. The Hon. Daniel Webster presided, as he can do, with great dignity; William Cullen Bryant, the Poet and Editor, delivered an oration, as flattering to the character of the deceased novelist, as was that of Mark Anthony's over the dead body of Julius Cæsar. It is the intention of the admirers of Mr. Cooper to erect a noble monument in this city as a token of their esteem. The writings of the Novelist form his best monument: they are an honor to his country, and are enduring evidences of his genius. His "Pioneer of the Susquehannah," and his "Skimmer of the Seas," exhibit the versatility of his genius and mental power. He has delighted thousands in every part of the world, and will continue to do so for generations to come,—while dead, he yet speaketh. His descriptions of scenery, and his delineations of character, are inimitable. He is the greatest American novelist; the only fault that ever struck us as a blemish in his works, is the short space of time into which he crowds events. Mr. Cooper was not beloved by his neighbors, nor countrymen, generally. He has left no memory embalmed like that of Scott, in the affections of his countrymen. He was held to be aristocratic, irritable and unforgiving.

We commend the feelings which prompt our countrymen to erect a monument in testimony of their admiration for his patriotism, his genius, and the moral tone of all his writings. As a people, we are not distinguished for erecting monuments expressive of our admiration for the mighty dead. It is our opinion, although many abortive attempts have been made to erect monuments in this city, to distinguished Americans, that this effort of the admirers of Mr. Cooper will not end with this beginning: the right kind of men are at the head of the movement. We hope it will shame our people to erect a tablet to the memory of Robert Fulton. If any city in the world has a debt of gratitude to pay to any one man, it is the city of New York to Fulton. It was in New York waters where his perfectly successful efforts in steam navigation were made, and the benefits which have resulted to the city from his success, no man can estimate too highly. Every steamboat which walks the waters of our rivers and our lakes, is a monument of his perseverance and genius. Let those who know what steam navigation has done for New York especially, take shame to themselves (and all of us are without excuse) that a monument has not been erected to him long ago. It is a credit to England that she has erected a monument to that humble-born but great man and mechanician—James Watt. His tablet stands in Westminster Abbey, among the proudest of Britain's monarchs, warriors, statesmen, and poets.

The first perfectly successful steamboat constructor in Great Britain was Henry Bell, and although his boat was not launched for four years after Fulton's, still his countrymen have not neglected his memory.

In the month of April, 1839, while passing down the Hudson in the old De Witt Clinton, we were forcibly struck with the appropriateness of an elevated spot at West Point, as a situation for a monument to Fulton. Ten weeks after that, while sailing up the river Clyde, in Scotland, on the north shore, close to which the steamboat was running, we were peculiarly impressed with a tall but simple stone shaft, on which were inscribed only three words "To Henry Bell." The place was romantic; the blue highland mountains stood like giant sentinels, at the one side, and away to the west rolled the river to the Atlantic. We were told that it was to that place "Dumglass," Henry Bell's steamboat, made her first trip from Glasgow, 20 miles distant. The monument stands upon the remains of an old tower, part of the Roman wall, erected when Rome was Mistress of the World. It was the limits of that proud empire; beyond it the fierce Celtic tribes of Caledonia had never been conquered. We could not help saying, "how appropriate the place. Here where the military empire of Rome ended; the empire of marine steam navigation began; but in America we have no monument to Robert Fulton."

We do not undervalue the labors of John Fitch, James Rumsey, or John Stevens; the two first were prior inventors to Fulton, it was the same with Bell; Miller and Symington were prior inventors, in Britain, to Bell; but it is not a little remarkable, that the city of New York in America, and the city of Glasgow, in Scotland, are now more distinguished for building steamships than any other cities in the world. This is an evidence of the benefits conferred on both cities, by first successful efforts at steam navigation. These two cities were first in the race-course of the mighty waters, and they have not yet been overtaken.

To Subscribers—Our Half Volume.

The next number of the Scientific American will complete the half of volume 7. As many of our subscribers pay up every six months, we would respectfully solicit them to send in their subscriptions at the earliest date. It will also afford us pleasure to receive as many new subscribers as choose to send in their names; the more subscribers the better pleased are we; and our friends may say, "you need not tell us any more about that for we know it as well as you do yourselves." Very well, good friends, you know us, and we may say we also know you. We are much obliged to you for past favors; we keep no travelling agents; our circulation, which is now large, has been obtained principally by our subscribers asking friends to subscribe. There is a very intimate relationship existing between us and our readers; we have derived both pleasure and profit by our connection, and a general satisfaction, we believe, exists. We endeavor to present as much new and useful information in a condensed form as we can. We speak freely upon all subjects, and when men endeavor to deceive their countrymen, by pretended inventions, we speak out for truth and the people. We believe that we have done much good to our country by the course we have pursued on all questions. We are not perfect, but we claim to be honest in what we say; it is nothing to boast about, it is our duty. The tone of the Scientific American is moral from principle not from policy. We have tried to be first in the field with those things relating to science and art that are of general practical utility, and we have been successful. We shall still labor with assiduity, and we know that our subscribers, as heretofore, will encourage us. From small things, the Scientific American has arisen to be what is termed "the best mechanical paper in the world," our subscribers have been the means of bringing this about. The larger our subscription list, the more we expend to illustrate our pages, and gain rare information. This volume, when completed, will be the best yet published. See our prospectus for particulars.

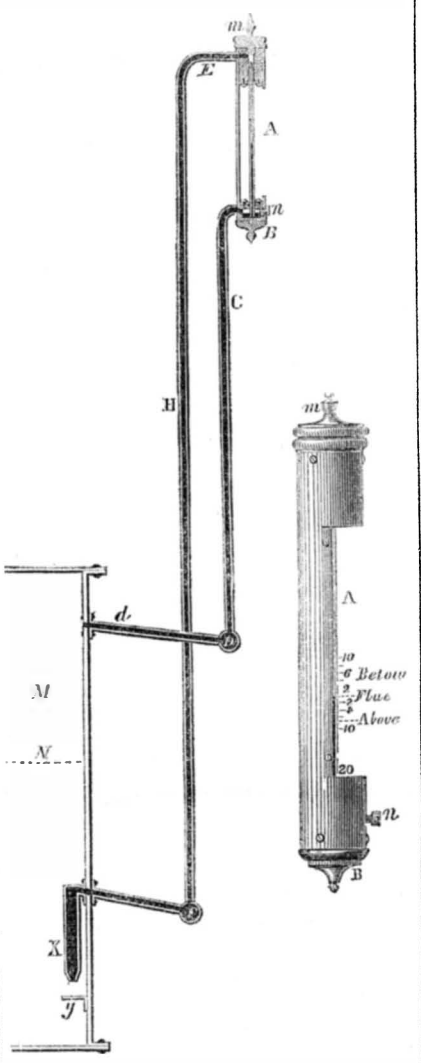
Velocity of Light.

There are two theories respecting the motion of light; one is the *emission* theory of Newton, the other the *undulatory* theory by Euler and others. Dr. Hare, of Philadelphia, believes light to be "a subtle matter conveyed by vibrations." By the emission theory, it was asserted that light passing from a rarer to a denser medium was increased in velocity. M. Foucault, of Paris, at the request of M. Arago has recently made a number of experiments to test the two theories, and it is said, "has fully established the theory of undulation," viz., that light travels with less velocity through a dense than a more rare medium—swifter through the air than water. The question then arises, "are not these theories mere names for the mode of action of a certain subtle matter which is termed light?" If light is not a matter why does it not travel with the same velocity through every medium? The answer may be, "light is not a matter, it is merely the name for a certain action of matter, as sound is also for a certain action of matter." Light is the product of a certain action of certain bodies under certain conditions, this is all that can be said about it; its mode of action is quite a different thing. The principle of right and goodness is compared to light, and so is truth. The great Infinite—He who is called the Moral Light of the World, could alone create light. "A universe of darkness," says Hunt, "would be universal death." The finest apostrophe to light ever penned by mortal man, was by blind John Milton, in his lamentation for the loss of his sight.

Lyman's Boiler Gauge.

This gauge is the invention of Mr. A. S. Lyman, the inventor of the Radiator which was illustrated in our last week's number.

The engraving exhibits the gauge applied to a boiler, also the gauge enlarged and by itself.



M represents the boiler filled with water to N, the top of the flue. A is the gauge or water level indicator, consisting of a glass tube with both ends open, and its lower end immersed in a small cup of mercury. B is the cup of mercury; C D is the tube connecting this cup, above the mercury, with the steam chamber of the boiler. E F is a tube connecting the upper end of the glass tube with the lower part of the boiler. The tube, C D, is slightly bent downwards, as it leaves the boiler at *d*, so that when once filled it remains full of water. We have now a syphon consisting of the shorter leg, D C, and the glass tube A, and the longer leg, H E. This syphon is filled with water, and would all run off by the longer leg, were it not for the mercury in the cup, B, which is forced up the glass tube until, together with the water in the shorter one, it balances the column of water in the longer leg, and this mercury rises to a greater or less height, as the difference in the length of the two legs is increased or lessened. The part, F, of the lower leg below the water surface of the boiler, is balanced by the water in the boiler; and as the water in the boiler rises, more of the column of water in the longer leg is supported, that is, the difference in the length of the two legs of the syphon is lessened, and the mercury falls 2-25 of an inch, while the water rises one inch. If, in the attachment, *d*, the end of the shorter leg is 50 inches above the surface of the flue, the mercury will stand 4 inches high in the glass tube when the water falls to the surface of the flue. At this point on the scale, the word "flue" is engraved, and the scale above and below, is divided into spaces of 2-25 of an inch. The mercury falls through one of these spaces for every inch the water rises in the boiler. In attaching such gauges to boilers, it is necessary to connect the shorter leg, at D, 37½ inches from the top of the flue or the point first exposed to extra heat when the water falls too low, and for this reason it is made the zero.

Directions.—When steam is raised, open the cock, F, so that the water will flow from the boiler towards the gauge. Turn the three-way cock, D, so that the water will escape from it. The water then passes from the boiler through the cock, F, up the longer leg of the syphon, down the glass tube, the remainder of the short leg, and out of the cock, D. As soon as water flows freely, close the cocks, D and F. The syphon is now filled with water. The mercury is then introduced into the the gauge by unscrewing cap, *m*, and plug, *n*. It should come up to the level of the opening at *n*. The cap and plug are now fitted and the cock, E, opened first and then the one, D. All the air must be allowed to flow out at the plugs, *m n*, before the gauge is truly ready.

Srdiment Depositor.—If the water in the boiler be not very pure, the lower tube will get choked by sediment, unless prevented by some means; this is accomplished by deposition chamber, K, which is a tube three or four inches in diameter, closed entirely at the top excepting the opening into the small tube, F H. It has a shield, *y*, a few inches below it, to prevent steam rising into it. This sediment depositor is the reverse of the ordinary sediment collector used in English boilers. There is no commotion in it, and the impurities begin at once to settle and pass out into the boiler, and thus the tube is kept free. No impurities ever obstruct the tube *d*, as it enters the boiler above the water line. The tubes of this gauge are not liable to be choked—and even if they do choke, the fact can easily be detected, for the mercury, then, will not exhibit, as it should do, its variable action—it will sink out of sight into its cup; this may be proved any time, by closing one or both of the cocks leading to the gauge. The mercury always tells the position of the water; it is perfectly reliable. This gauge, unlike the common glass gauge, is not liable to be broken by changes of temperature. This gauge may be placed in any situation above or below the boiler, by the side of the engineer or in the captain's office, or in a room far away from the boiler. This is a great advantage for steam vessels or factories. It is not affected by foam.

Other information may be obtained by letter addressed to Mr. Lyman, at Brooklyn, N. Y.

Parker's Water Wheel.

Petitions have been presented to Congress for an extension of the patent for Messrs. Parker's Wheel. It has been extended once already. We have received quite a number of letters, recently, making inquiries about Parker's patent; the tone of them all is nearly the same; they state: "Parker's agents have been round here and asked for a patent tax on our wheel, threatening, if we did not pay it, to attach our property. Some of our neighbors have paid, through fear, but all think it rank injustice. The agents take what they can get, some pay pretty high, others get off for very little." An old gentleman, a Quaker, called upon us last week, who said that, in his settlement, they were using Wilson's Patent Wheel, for which they had paid the owner. They were threatened by Parker's agents, that if they did not pay a certain sum (we forget the amount) they would attach their property. Under such circumstances, we advise all those who are thus threatened not to pay. The old Quaker said he did not want to go to law, but there was something that looked very bad about the conduct of such men, and he did not pay. We told him not to pay. No patentee can attach the property of any man without a trial at law, and a writ granted by a United States Court. We believe that Mr. Parker has never made a great deal out of his patent; but this is no excuse for his agents acting in this manner. It is a sure way to create a general prejudice against all patentees, for these people who have been threatened did not know they were infringing his patent,—they had paid other patentees for their wheels.

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Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY, 24, 1852

KNITTING MACHINES—To Timothy Bailey of Ballston Spa, N. Y.: I claim, 1st., releasing the hanging plates from the lever by the inclined projections, as they are drawn up. so as to let the uprights and lever raise the locking bar.

Second, the combination of the catch (fastened to the upright), spring, and lever, operated by the groove in the curve, to raise the locking bar, so as to allow the slur to operate and depress the sinkers, to divide the loops, and form the stitches. and to raise the lever so as to be caught by the lip upon the plate, to lock down the locking bar.

CAST-IRON CAR WHEELS—By A. G. Bristol & J. C. Jackson, of Rochester, N. Y.: We claim making car wheels with double plates, extending from the hub to the tread—the plate, forming the face of the wheel to be slightly curved backwards, so that a section of it, through the centre, shall present a very flat arch. whose extremities abut against the rim of the wheel, the back plate, as it spreads from the hub, to be curved in the same direction as the front plate, but as it approaches the tread, to be gradually depressed at equal intervals, till it meets the front plate—to be thus thrown into a fold a plait. forming two walls of a triangular cavity, of which the third side is made by the face plate, and in this form to be continued till it meets and unites with the tread—the whole to be in the manner and form substantially as shown.

DUPLEX ECCENTRIC VALVE-MOTION—By J. J. G. Collins, of Chester, Pa.: I claim the employment of cogs on or to eccentric wheels, for giving motion to eccentrics, or their equivalents, on a second motion, in combination with the guard or framing. attached to the clips or straps of the driving eccentric. and so formed and arranged as to unite both vibrating motions derived from the driving and driven eccentrics, into one motion, for working the slide and other valves of steam engines, as specified.

STRAW CUTTERS—By Absalom B. Earle, of Oneonta N. Y.: I claim the method of cutting vegetable substances, by a combined chopping or percussive and shearing cut, produced by means of stationary knives at the mouths of the feeding troughs, moving knives, carried on an oscillating lever and revolving tappets, which actuate the oscillating lever, as described.

ENDLESS CHAIN HORSE POWERS—By H. L. Emery, of Albany, N. Y.: I claim the manner of constructing the converge gears, pinions, and pulleys of the endless chain horse-power, with their outer sides concave at their centres, sufficiently to receive their fastenings within the plane of the inner side of the arms, spokes, or faces, of such of the gears and pulleys which, when confined upon one shaft and overreaching the other shaft, may pass both shaft and fastening freely, the faces of the several couplings, or shoulders, upon the shafts, as also the ends of the shafts themselves, being in the same planes, and all the fittings and fastenings of the shafts, gears, and pulleys, agreeing with each other, for the purpose described.

VESSELS FOR MAKING INK—By Alex. Harrison, of Philadelphia, Pa.: I claim the arrangement and connecting together a series of vessels, for manufacturing ink, in the manner and for the purpose as set forth.

ZINC WHITE—By S. T. Jones, of New York City: I claim the use of a porous or fibrous bag or receiving chamber, with porous sides or bottom, or an air-tight chamber, with a straining or porous bag, adapted to the inside thereof, and used in connection either with a blowing or exhausting apparatus, so that the products of the distillation and oxygenation of zinc, or other volatile metals, may be separated from the accompanying air and gases, which latter will be forced, or otherwise drawn through the pores of the cloth bag or chamber, and escape into the atmosphere.

SAW MILLS—By O. B. Judd, of Rockton, N. Y.: I claim raising the tail block, as described, or in any other way substantially the same.

WATER WHEELS—By J. B. Nott, of Guilderland, N. Y. & Wm. S. Kelly, of Princeton, N. Y.: We claim a water wheel, composed of a scroll or section of scrolls, or arcs of circles, or sections of polygons, substantially as described. in combination with a fixed inter guide or guides, made in a manner substantially similar to the float or floats of the wheel, but with the direction in reverse, there being sufficient space between the outer extremities of the guide or guides, and the inner extremity of the float, to allow the water to pass between them in all positions—the space between them being substantially on the disc of the wheel, thus causing the driving current of water to pass between the two, in the direction of the wheels motion and act directly upon the inner face of the wheel, propelling the wheel in the same direction with the current—the water being discharged, nevertheless, at the extremity of the scroll, helix, or arcs of circles, or sections of polygons or either, of which the wheel may be composed, in a direction opposite to that in which the wheel revolves.

CUT OFFS—By F. E. Sickels of New York City: I claim operating the catch, or hold, and liberating the valves of cut-offs on the movement to close or return motion of the valve, after it has been partially operated upon in opening, substantially in the manner as described, so as to leave as little of the catch to be operated, to effect the liberation of the valve, as may be desired to be accomplished on the return movement; thus being enabled to liberate the valve and cut off the steam, as near the first of the return movement, as may be desired.

GRAIN WINNOWERS AND WEIGHERS—Thos. T. Strode, of Coatesville, Pa.: I claim combining a balance lever weigher with the lower portion of the winnowing machine, whereby the grain, when cleaned, is weighed and removed therefrom, by a portable receiver, as described.

I also claim constructing the balance lever weigher and mounting the same upon pivots, or knife edge bearings, whereby its rearward projecting ends, are made to serve as ways, or inclined plans, upon which is mounted a portable receiver, so as to balance the weigher, whilst its frontward ends are graduated and furnished with weights, by which the number of bushels weighed at each time, may be indicated as described.

WATER GUN FOR EXTINGUISHING FIRE—By Miram Strait, of Covington, Ky.: I claim, first, the combination of the flange cap and guard, constructed and operating in a manner substantially as described.

Second, constructing the barrel of the fire gun of successive layers of sheet metal, and casting the breech, trunnion ring, and flange thereto, in manner substantially as described. [Another Annihilator.]

BORING HUBS FOR BOXES—By Henry Sidle, of Dilloburg, Pa.: I claim the iron shaft in two parts, with the socket and screw in the centre, so as to increase or dimish the length of the shaft, and also to feed the bitts, as described, whereby a hub may be clamped, bored at both ends for the boxes, and removed from the machine, without removing the cutters from the shaft, replacing them, or changing the ends of the hub or shaft.

GRAIN DRIERS—By T. E. Weed, of Williamsburgh, N. Y.: I claim, first, the centre hollow shaft for the double purpose, first, for forming the support in the centre for the steam chambers and pans, as described; and, second, for forming a passage for the steam to pass into each of the chambers, for heating the machine.

Second, I claim, substantially as described, the arrangement of the air chambers behind the doors and pans, with openings in them, for a thin blade of air to escape in a circle from the centre, at a right angle, or nearly so, with the main shaft, and the pipe extending through the machine, as shown, for supplying the chambers with air, operating substantially as set forth.

FLOATING DOCKS—By O. T. Williams, of Smithland, Ky.: I do not claim forcing air into a vessel. immersed, or partly immersed in water, for the purpose of rendering it buoyant, or of admitting water for the purpose of allowing it to sink; but I claim so forming a cylindric or prismatic dock, as to perform the operation of elevating a vessel above the surface, by combining the buoyancy obtained by injecting air into the cylinder, with the forced revolution of the cylinders on their axes, while lying on the water, as set forth.

Second, I also claim making the rigid submerged elevator, in such a manner as to be actuated by compressed air, only so long as to get rid of the contained water, and to be freed from the interior pressure, while sustaining its load above the surface of the water, whereby the liability to accident from the escape of air, under high pressure, is avoided, substantially as described.

Third, I also claim, in combination with a flexible tube for conveying injected air, the use of the revolving pipe, directly connected therewith, whereby the pipe may be turned, as described, for varying the direction of the current of injected air, by turning the flexible tube, as set forth.

Fourth, I also claim, in combination with the flexible tube for the injection of air, the opening in the bottom of the cylinder, and the vents in its top, whereby the dock is rendered buoyant, while wholly immersed in water, and freed from interior pressure, on rising to its maximum height on its surface, substantially as set forth.

Fifth, I also claim the double par buckle or analogous turning apparatus, whether a rope or a chain with friction rollers in its links be used, for the purpose of turning the opposite elevators in opposite directions, for the purpose of raising the vessel above the water, in the manner set forth.

LIGHTENING VESSELS—By Orrillus T. Williams, of Smithland, Ky.: I claim the elevator, formed by combining jointed frames of inflexible materials, with flexible enclosures, made air-tight above and open below, when said jointed frames are so constructed as to attach themselves to the bottom of a vessel after being let down by its side, and the flexible enclosure so arranged as to admit of the injection and retention of air beneath it, for the purpose of buoying up the vessel, substantially as set forth.

Second, I also claim making jointed elevator frames, in such a manner as to adjust themselves to the form of a vessel's sides, whereby the flexible enclosure for air, is allowed to come in close contact with the outside of the vessel, in the manner and for the purposes set forth.

Third, I also claim, in combination with a flexible enclosure for retaining the air, the hook, upright or chain, brace, and stretcher, whereby the elevator is made capable of attaching itself to the vessel and of raising the same, without the necessity of passing a support beneath the keel, as set forth.

DESIGNS

FOR STOVES—By James Leffel, of Springfield, O.

PARLOR STOVES—By N. S. Vedder & Wm. L. Sanderson, of Troy, N. Y., (assignors to Warren, Swetland & Little, of Half Moon Village, N, Y.)

World Makers.

Science is a collection of facts acquired by observation, and systematized for usefulness. There are many men, however, who have a scientific reputation, much of which is derived from mere assertions respecting natural phenomena—their own deductions—which may be altogether erroneous. This, we believe, is the case with the "World Makers," those Astronomical and Geological philosophers who have given utterance to their opinions respecting the manner this world and other worlds have been formed. The recent lectures of Prof. Guyot, of Cambridge, Mass., delivered in this city, to demonstrate the harmony of the Bible and orthodox faith with science, was, in our opinion an exhibition of science "falsely so called," because opinions were put forth for facts.

He asserted that the *days* in which certain great creative acts were performed, as mentioned in the first chapter of Genesis, were not days of 24 hours' duration, but great cosmogonic periods—they were epochs merely. Of chaos, as mentioned in that Book, he says:

"We know of only one state—the gaseous state of matter—which answers to this description. If the air in this room was not lighted, it would very well represent this void without form. Dark, invisible gaseous matter was the true state of chaos. When we dissolve or analyze a substance, we find always that we immediately go back to this very state of gas or chaos. He explained the gestation of an egg, as showing periods of development similar to those of creation. It was the opinion of St. Augustine that matter was originally a gaseous state, and that the days of Creation were vast periods. The 24 hour day is a modern idea in the history of the church. Next we read that God said, 'Let there be light.' He did not say *make* light; he did not create light; that, or rather the chemical principle which produced it, existed. It was simply developed, by the fiat of the Almighty. The text is in perfect accordance with the present opinion of the wisest astronomers and men of science. Now comes in the action of gravitation; molecules begin to attract each other, and the result is light and heat. As this attraction goes on, nebulæ are produced. As, at the present day, the concentration of nebulous matter advances, we find more brilliant centres of light, which shows clearly that the development of light was the first visible step in the process of creation.

La Place thought the solar system was, at first, one vast nebula, in a high state of heat from chemical action. It revolves and cools, and a ring near the equator is broken off; this ring of matter, or condensing gases, continues to revolve, but is soon broken in pieces, and the fragments form planets, still keeping the momentum which they had from the main body of nebular matter. Thus planet after planet were formed as the original nebula condensed and shrunk up. The farthest planets were formed first, down even to the sun itself. He proceeded to explain the planetary motions, which are known to be what would have been supposed they would be from the origin of the moving force. Perhaps the chemical elements may not yet be fully explained; but these, with the mechanical theory of La Place, will explain all existing motion. A similar theory has been advanced in this country by Prof. Stephen Alexander, of Princeton. Now suppose that the great primitive nebula, rotating upon its axis, is in fact the beginning of things. We shall be able by this theory to explain not only our own system, but the entire phenomena of the universe. The formation and dispersion of globes is still going on. Though immense distances prevent us from seeing the movements of what we call fixed stars, they do move, they are keeping up the revolution of the great primitive nebula from which they sprung. We see then, that these motions produce just such a separation of matter as is laid down by Moses. The lecturer proceeded to explain the variety produced by these motions. It was the same order of development that subsequently produced such pleasing varieties of organic matter."

We have quoted enough for our purpose, which is to object entirely to the Nebular hypothesists; they have no business to propound such a theory and link it with religion, and endeavor to make the Mosaic account of the Creation as flexible as india rubber, to square with their notions. We have no objection to their theorizing upon established facts, but we do object to a theory of suppositions. Mr. Field recently delivered a lecture in St. Louis, and advanced the same doctrines; and we may say at once, that nearly all our Scholastic Professors entertain the same opinions. The doctrine they inculcate is founded on the doctrine of the old Materialists, "matter is eternal." This Mr. Field plainly asserts, by quoting the heathen adage, "*ex nihilo nihil fit*,"—from nothing, nothing can be made. We believe, with the author of "The Footprints of the Creator," that a great battle for truth will be fought with science, but at the same time there can be no such a thing as science apart from logic. This is the fault we find with the gaseous theorists, they have propounded a theory with a wretched logic to recommend it, and, what is worse, they torture revelation because they are not courageous enough to attack it openly and manfully.

Neither La Place nor Prof. Stephens is the originator of the Nebular theory, as a whole It is an old story newly vamped up. "Burnet's Sacred Theory," asserted that the earth before the flood was "a fluid mass, a chaos of various substances differing in density, the heaviest of which fell to the centre, and the rest on the top according to their gravity."

Whiston, in his theory of the earth, supposed it to be originally a comet, and was such at the time mentioned in Genesis, when it was then placed as a planet in our system. Before that, he says, "it was without form and beauty, it was a molten mass hotter than molten iron and had a dense fluid atmosphere—a surrounding *chaos*." At the Creation, the earth was put into its orbit, and wheeled along in its course, but part of the heat it had before received, still remained, and which he believed would take 6,000 years to cool—that the earth we live on is a mere crust on the top "of a hot fluid mass, the heaviest parts deepest down."

He believed the flood was caused by the tail of a comet. A recent letter from one of our correspondents propounds the same views, and the author of it believes that the American continent is part of that comet, and the Indians a race peculiar to that comet. Buffon believed that the earth, and all the planets in our system, were formerly a part of the body of the sun, and that a comet fell upon it, and struck off the planets in our system, as sparks are struck by a blacksmith from a bar of red-hot iron. Thus La Place and Stephens and Guyot are only patchers of the older World Makers.

We cannot account for the reasons why they wish to make the earth originally a mass of gas, unless it be that they are afraid to deny the quality of eternity to the matter of which it is composed. But to us it is just as easy to conceive of the space which the world now occupies being a blank, as to conceive that we ourselves had no existence before we came into being. There are too many who mistake the operations of matter for the qualities with which it is endowed by its Creator. Man, with all his intellect, is just as incapable of understanding the origin of the world, or of comprehending the idea of creating something out of nothing, as a butterfly is of reasoning of the origin of man. If the earth were an original mass of gaseous fluid, it could not be chaotic in that state, at least there is no reason for supposing it was, for fluids and gases are governed by as certain laws as the solids are. If this world were originally in a state of gas, and if we allow its materials, in that state, to have been 1,700 times expanded (a moderate calculation), then our nebular globe must have had a diameter of 7,912× 1700=13,450,400 miles. Just imagine a mass of gases in chaotic confusion, according to Guyot & Co., of more than thirteen millions of miles in diameter, and this tossing away through space like a ship without sail or rudder. These philosophers, while they talk of, have strange ideas of the Divine Government.

There is another point to which we wish to allude, that completely annihilates their theory—it is this: was gold ever in a state of gas? No. It might have been held in solution as a fluid, but not as a gas, and it is found in its natural state as a metal unoxygenized, thus proving that gravity, as a mechanical law, nor any chemical law with which we are acquainted, had anything to do with the production of gold, *per se*. Shallow theorists talk of matter, as a whole, forgetting that matter is a mere term for more than sixty different substances. They leave logic out of their deductions, and common sense too, when they talk about the laws of matter, and matter as a whole, and leave out of question the endowed properties of matter.

We can easily conceive of a world without a race of men, or races of animals. We can also easily conceive of a world without gold or silver, irridium or platina; and if we consider the world made up of substances, *a b c e*, we can easily arrive, by mathematical inquiry at the point $(a\ b\ c\ e) - (a\ b\ c) = e$. Now if we can arrive at this deduction, what is to hinder the mind from supplying the next link to our argument $(a\ b\ c\ e) - (a\ b\ c\ e)$. Logic, chemistry, mathematics, and observation, incline us to believe, that this globe—the various substances of which this earth is composed—were made and arranged, in a very short period by the Great Architect of the Universe. There is one thing positively certain, there are no nebulæ—no gaseous chaotic masses—now rolling away independent of the law of gravitation; and what evidence have we that there ever was? None.

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TO CORRESPONDENTS.

G W. S., of N. J.—You must submit your plans to Mr. Ray, at the opening of the next fair of the American Institute. As yet they appear to be crude, and must needs require more thought. The suggestions do not seem to meet the necessity in the case.

C. L., of Ohio.—We have examined yours of the 17th inst., and would state that the employment of a mirror for the purpose described, is absurd, and of no value. No corporation would place any reliance upon it, or the self-acting switch, as there are a vast number of the latter patented but not used. The plan to prevent breakage of wheels and axles is not so simple as the one noticed in our last number, and we cannot recommend it.

G. W. S., of N. J.—We had a pendulum in our office a year ago, which covered all the points represented in yours. It was left there by an inventor from the interior of the State. Have not learned of his having done anything with it.

I. H. B., of Ohio.—We think your saw-filer new and patentable, but would scarcely dare venture to praise or condemn it. There are more simple contrivances employed for the purpose, which we believe work well. You can determine its utility by practice alone. $1 received.

W. B. N., of Ten.—The loss allowed between the boiler and cylinder of a high pressur engine is about 3 per cent. A square yard of heating surface is allowed for a horse power.

W. M., of Ill.—We could not give you the information by word; it is of a kind which alone can be acquired by practice. Try and get a good sawyer.

E. T., of Va.—You will gain some power by the use of your re-action wheel. A model showing the improvement is all that is required, but we give you no encouragement about getting a patent.

G. W. C., of——.—A steam engine of ten horse power would answer your purpose. The cost, boiler and all, would be about $1000, for a good one. We are not acquainted with the price of machinery for kiln drying grain, &c.

I. R. K., of Geo.—The apparatus will not answer for making gas from pitch pine, but the common gas retorts will. The gas from oil does not require to be purified like coal gas. We do not know what price Booth's apparatus could be procured for. We believe, if resin is cheap in your place, that the common gas apparatus—the same as that used in cities, but smaller, would be found profitable and pleasant by you. Many of the factories here use coal gas. If a person is desired to put up either a coal or oil apparatus, an advertisement in our columns would, we believe, find the man.

B. E. P., of Vt—Tell your friend not to expend a single penny on machinery for pumping up water by chain pumps in expectation of gaining any power. A water wheel cannot pump up quite so much water as it takes to move it, and it makes no matter what kind of pumps are used. This is according to the principles of mechanics.

C. H. S., of La.—We have your favor of the 8th inst. You had better correspond with F. H. Smith, of Baltimore, about the machine. We shall send the paper 6 months to Mr. R.

C. C., of Mass.—The spring you suggest is not new; it has been long known. Hammers are sold so very cheap, that it would scarcely pay to construct such a handle as you offer for consideration. We do not think a patent could be obtained for it.

W. N., of Ill.—The weight on the sash is an advantage to prevent vibration of the frame, but then it must be proportioned to the work it has to do. We like the frame saw best.

H. G., of Mo.—We do not perceive any new feature in your method of constructing blinds, or in operating them. Iron plates are much in use here, both for outside and inside blinds, and the rack and pinion for operating them is well known, but little used. The same device you describe was at one time employed on the wooden blinds of our own office.

Money received on account of Patent Office business or the week ending February 28.

C. P., of N. Y., $30; E. N., of N. H., $35; C. W. G., of N. Y., $30; S. T. F., of Ms., 20; D. H., of Va., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Feb. 28:—

J. M., Jr., of Ct.; S. B., of N. Y.

New Arrangement.

Several of our readers have expressed a wish to subscribe for some literary journal in connection with the Scientific American, not feeling able to take both. We have entered into an arrangement with the publishers of the "American Model Courier," of Philadelphia, and the "American Union," of Boston, which will enable us to furnish either of the two, with the Scientific American, for $3 per annum. They are literary journals of the first order, and are widely circulated in all sections of the country.

An Important Paragraph.

Whenever our friends order numbers they have missed—we always send them if we have them on hand. We make this statement to save time and trouble, to which we are subjected in replying when the numbers called for cannot be supplied.

The Post Office Laws do not allow publishers to enclose receipts; when the paper comes regular subscribers may consider their money as received.

Subscribers ordering books or pamphlets are particularly requested to remit sufficient to pay postage.

New Edition of the Patent Laws.

We have just issued another edition of the American Patent Laws, which was delayed until after the adjournment of the last Congress, on account of an expected modification in them. The pamphlet contains not only the laws but all information touching the rules and regulation of the Patent Office. We hall continue to furnish them for 12 1-2 cts. per copy

ADVERTISEMENTS.

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Advertisements already paid for will be continued until the expiration of the time for which they are paid, at former rates, and then discontinued, unless the parties manifest a desire to have them continued at the advance rate, and remit accordingly.

☞ All advertisements must be paid for before inserting.

American and Foreign Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

NEW HAVEN MANUFACTURING COMPANY, Tool Builders, New Haven, Conn., (successors to Scranton & Parshley) have now on hand $25,000 worth of Machinist's Tools, consisting of power planers, to plane from 5 to 12 feet; slide lathes from 6 to 18 feet long; 3 size hand lathes, with or without shears; counter shafts, to fit all sizes and kinds of universal chuck gear cutting engines; drill presses, index plates, bolt cutters, and 3 size slide rests. The Co are also manufacturing steam engines. All of the above tools are of the best quality, and are for sale at 25 per cent. less than any other tools in the market. Cuts and list of prices can be had by addressing as above, post-paid. 25tf

WHITE'S TUBULAR SUSPENSION Bridge. The subscribers would respectfully announce that they have recently obtained Letters Patent for the above invention, and are now prepared to contract for, and build at their own risk, bridges extending any required length short of two thousand feet at one span, and sustaining any specified weight. The principles involved in the construction of this bridge, combining as it does the practicability of spanning long reaches, together with strength, economy and durability, have secured it the favorable notice and admiration of many of our most skillful and scientific men. Those interested in Bridge building, may address either of the proprietors. AMMI WHITE, 17 Prospect street, Boston. JOSHUA P. THAYER, Cambridgeport, Mass. 25 3*

J. ADAMS & SONS, AMHERST, MASS.—Patent Felly Machine. Belden & Colton, 98 Chamber st, New York; John B. Wynn, Anderson C. House, S. C.; Agents for sale of rights of machines and territory. W. Fishman & Co, Baltimore, Md.; P. A. Leonard, New York City; Agents for sale of Machines. 25 4*

ENGINEER AND SAWYER WANTED.—Wanted to go to a beautiful and healthy situation in Florida, a practical Engineer and Sawyer, who is capable of taking charge of, and putting in operation, a small steam engine and portable saw mill. Moderate terms; good references required. Apply to F. G. JENNE, 142 Bridge st, Brooklyn. 1*

POST'S PATENT SLIDING DOOR FRONTS—for stores and Public Buildings; a new, cheap, and simple fixture for securing store fronts, which renders them fire and burglar proof, has been invented and patented by the subscriber, who is now prepared to sell rights. Messrs. Quarterman and Son, 114 John st, N. Y., are general agents. Address, (post-paid) Wm. POST, Architect, Flushing, L. I. 25tf

IMPROVEMENT IN PIANOFORTES—CHROMATIC KEYS.—The difficulty of effecting rapid movements on the chromatic scale in running the fingers over the keys of the instrument, is well known to every practical musician, and this exercise requires playing many years to become perfect in it. By the invention of the chromatic keys, every pupil playing the piano will learn the chromatic scale and each difficult chromatic passage, in a few hours, with a rapidity of movement equal to the greatest pianists. This invention is simple cheap, and useful. More information may be obtained by letter addressed to the inventor, W. F. FURGANY, Albany, N. Y., who has taken measures to secure a patent. The price of a set of 1 octave chromatic keys is 75 cts. 24 2*

TO BLACKSMITHS—Porter's Patent Graduating Forge Tuyere, which has been proved to save $75 per annum to each fire, and which was illustrated and described in the Scientific American of Sept. 6, 1851,—is now manufactured in this city, and is offered wholesale and retail at 258 Third st., near Avenue C, and No. 9 Gold st. New York. All orders or letters requesting information, addressed to W. J. & J. H. BURNETT, at the latter place, will meet with prompt attention. 24 2*

DRAUGHTING BOARDS.—CHAMBERLIN'S PATENT, 23x29 inches, 28 feet of various scales, arranged for draughting of all kinds with dispatch, and mechanical device for ready adjustments of draught sheets, of thorough made and elegant appearance, approved by the American Institute, N. Y., and various other authority. Price with T rule $10, can be sent by express. Address, post paid, H. W. CHAMBERLIN, Pittsfield, Berkshire Co., Mass. 24 4*

LATHES FOR BROOM HANDLES, Etc.—We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch and work as smoothly as on a straight line—and does excellent work. Sold without frames for the low price of $25—boxed and shipped with directions for setting up. Address (post.paid) MUNN & CO.
At this Office.

MALLEABLE IRON FOUNDRY, EASTON, Mass—The subscriber continues to manufacture castings of every variety, for machinery and other purposes, of the best quality, at the above establishment. We have facilities for making castings 5 1-2 feet in length. Persons wishing castings can send patterns to Eastern Express, Boston, Mass. All letters will be promptly attended to.
21 10* DANIEL BELCHER.

METALLIC LETTERS AND FIGURES FOR PATTERNS.—

Price	3cts.	3cts.	3cts.	3cts.	4cts.	4cts.	4cts.
Size,	5-16	3-8	7-16	1-2	9-16	5-8	3-4

6cts., 1 in.; 7cts., 1 1-4 in.; 8cts., 1 1-2 in.; 10cts., 2 in. Also Gothic Style: 3cts, 1-4 in.; 4cts., 1-2 inch. Manufactured by COWING & CO., Seneca Falls, N. Y. Orders solicited. They can be sent to any part of the Union, either by Mail or Express, as all packages are weighed and sent the cheapest way. 22 4*

THE SUBSCRIBER is now finishing four 14 horse engines, with boiler and apparatus all complete—price $1200 each. Several 6 horse engines extremely low: also, several of smaller capacity, completely; also, several power plainers, now finishing. Galvanized chain for water elevators, and all fixtures—price low—wholesale and retail. Orders, post paid, will receive prompt attention. AARON KILBORN.
No. 4 Howard st., New Haven, Ct. 23 10*

TO ARCHITECTS, SCULPTORS, &c.—The Commissioners of the Greene and Pulaski Monument Lottery Fund, offer Three Hundred Dollars for an approved design for a Monument, to be erected to the memory of Count Pulaski, in Chippewa Square, Savannah. Architects, Sculptors, Designers, &c., are invited to offer plans and specifications for selectmen, and to evince their own taste and judgment as to design, with no other limit than the cost, which must not exceed $17,000. Designs will be received until the 1st day of April, 1852, by the subscriber, from whom any further information may be had.
WM. P. BOWEN, Secretary.
Savannah, Geo., Jan. 13, 1852. 21 6*

TO INVENTORS.—I beg respectively to suggest that the establishment of a National Inventor's Institute, with regularly organized branches, would be the best means to assist your efforts to superintend your interests, and protect your patent rights. JAMES NIXON, Potosi, Wisconsin. 21 5*

TO FELLOE AND SNATH MAKERS—The undersigned having purchased the entire right of A. W. Johnson, for his machine for bending carriage felloes, &c., are now prepared to sell State or county rights for said machine; having used said machine for several years, we know it to be a saving in timber of 30 per cent, and more expeditious. Persons can see one of the machines at work at the manufactory of W S. Johnson & Co., St. George's, Del.; also felloes of all kinds. Shafts and carriage stuff always on hand, and at prices to suit dealers in the above. WM. G. JOHNSTON & Co,
22 10* St. George's, Del.

MORTISING MACHINE.—Dear Sirs: I received the Portable Mortising Machine about 3 weeks ago; I have used it, and am very well pleased with it. It is the best plan of a machine of the kind I have ever seen. W. R. McFARLAND.
Nashville, Tenn., 1851.
This machine is simple, durable, and effective, and is boxed and shipped for the low sum of $20.
MUNN & CO.

A CARD—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubbs) and Swiss Files and Tools; also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English styles—which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools and manufacturer of Mathematical Instruments, 154 Fulton st. 23 13*

IRON FOUNDERS MATERIALS—viz.: fine pulverized Sea Coal, Anthracite and Charcoal, Black Lead and Soapstone Facings. Iron and brass moulding sand; Core sand and flour; English Fire Bricks for cupolas, &c. Fire Sand and Clay—for sale by G. O. ROBERTSON Liberty place, (near the Post Office) N. Y. 23 10*

$150 REWARD—One hundred dollars for complete working drawings, with elevation of the same, of the most elaborate and best-proportioned Stationary Horizontal High Pressure Engine; bore 12 inches, stroke 30 inches. The design must combine with ornament, simplicity and cheapness of construction, and yet be susceptible of extreme finish, with as little hand labor as practicable. Fifty dollars reward, also, for the best Upright Engine, with same combinations, bore 10 in. stroke 20. The above are wanted for a special object, and the different designs will be submitted to a competent committee, who will make the awards. Heater, pump, and connections, and fly-wheel must be included.—Refer to W. B. Leonard, 60 Beaver st., N. Y. Open till March. Mail to A. Z. & Co., New York. 24 3

VENTILATION—In reference to the advertisement which I have had in this paper for some time, and also in reference to the reward offered by F. M. Ray "for the best method of excluding dust from cars when in motion." I beg to inform car building companies, railroad companies, and steamboat companies, that my patent includes the Ventilation of all these vehicles, and covers the whole ground of "excluding dust," &c. I expect to be in New York and Boston some time next month, of which notice will be given in some of the daily papers, as also of the place where I may be found. H. RUTTAN.
Coburg, Canada, Feb., 1852. 24 5*

TO COTTON MANUFACTURERS AND MACHINISTS—The undersigned having had thirty-five years' experience in the manufacturing and machine business, is desirous of obtaining a situation as foreman or agent in the above branches; would have no objects to go South or West; the best of reference can be given. Letters addressed to CHARLES E. MOORE, Groveville, Mercer Co., N. J., will be attended to promptly. 24 4*

BEARDSLEE'S PATENT PLANING MACHINE, for Planing, Tonguing and Grooving Boards and Plank.—This recently patented machine is now in successful operation at the Machine shop and Foundry of Messrs. F. & T. Townsend, Albany N. Y.; where it can be seen. It produces work superior to any mode of planing before known. The number of plank or boards fed into it is the only limit to the amount it will plane. For rights to this machine apply to the patentee at the abovenamed foundry—or at his residence No. 764 Broadway; Albany. GEO. W. BEARDSLEE. 23tf

WATTS & BELCHER, Manufacturers of Steam Engines, Lathes, Planing Machines, Power Presses, and Mechanics' Tools of all descriptions. Orders respectfully solicited and punctually attended to. Washington Factory, Newark, N. J. 7 20*

PAINTS, &c. &c.—American Atomic Drier, Graining Colors, Anti-friction Paste, Gold Size, Zinc Drier, and Stove Polish.
QUARTERMAN & SON, 114 John st.,
23tf Painters and Chemists.

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Morticing and Tennoning machines; Belting; machinery Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 13 tf

WOODWORTH'S PLANING MACHINE—For sale, the right to use this justly celebrated labor-saving machine in the following States, viz., Pennsylvania west of the Allegheny Mountains, Virginia west of the Blue Ridge, Ohio, Indiana, Kentucky, Tennessee, Wisconsin, Iowa, Missouri, Arkansas, Texas, Louisiana, Florida, Alabama, and Mississippi. For particulars apply to the Proprietor, ELISHA BLOOMER, 208 Broadway. 17 12*

WOOD'S IMPROVED SHINGLE MACHINE—Patented January 8th 1850, is without doubt the most valuable improvement ever made in this branch of labor-saving machinery. It has been thoroughly tested upon all kinds of timber and so great was the favor with which this machine was held at the last Fair of the American Institute that an unbought premium was awarded to it in preference to any other on exhibition. Persons wishing for rights can address (post-paid) JAMES D. JOHNSON, New Haven, Ct.; or WM. WOOD, Westport; Ct., All letters will be promptly attended to. 22tf

THE EXCELSIOR Sand and Emery Papers. are offered as new and superior articles, being manufactured by an improved process; the paper is made from the best Manilla hemp, and consequently is very strong and lasting; the grit is of the sharpest and most enduring kind, and is firmly attached to the paper with a remarkable evenness of surface; their freeness from ridges, stripes, and other imperfections, recommend them to the notice of consumers. These papers have been used by many of our first mechanics, and are pronounced superior to all others. Every sheet is stamped WM. B. PARSONS, and warranted. Samples furnished at the office, No. 187 Water street, New York. WM. B. PARSONS,
14 6m* Sole Proprietor.

P. W. GATES'S PATENT DIES FOR CUTTING SCREWS—Patented May 8th, 1847.—This Die cuts Screws of any size, V or square thread, by once passing over the Iron. Also, Lead Screws for Lathes, Hoisting Screws, &c. All orders for Dies and Taps, with or without machines, will meet with prompt attention by addressing P. W. Gates, or Gates & McKnight, Chicago; Marshall, Bement & Colby, Philadelphia; Woodburn, Light & Co., Worcester, Mass. References—All the principal machine shops in New York, Philadelphia, and Boston. 13 6m*

MACHINIST'S TOOLS.—Marshall, Bement & Colby, (successors to E. D. Marshall & Co) Callowhill street, west of Schuylkill Third, Philadelphia, Pa., are prepared to make to order, and keep on hand Machinist's Tools, such as Planing and Compound Planing Machines, on a new and improved plan, Slide and Hand Lathes, Upright and Horizontal Drills, Upright Boring Machines, Improved Screw and Bolt Cutting Machines, with P. W. Gates' Patent Dies and Taps, or with the common Dies, Gear Cutting Engines, Slotting and Paring Machines. Also keep on hand Washburn & Whiton's Patent Scroll Chucks, of all sizes. All orders by letter or otherwise will receive their prompt attention. E. D. MARSHALL, WM. B. BEMENT, G. A. COLBY. 21 10 *

CHAS. W. COPELAND, Consulting and Mechanical Engineer, Surveyor of Steam Machinery, &c., No. 68 Broadway, N. Y., superintends the construction of steam vessels and steam engines, and machinery of every description; specifications and contracts prepared; also general plans and drawings in detail furnished. Steam engines surveyed and valued, and condition reported. Mr. C. also acts as agent for the purchase and sale of steam vessels, steam engines, boilers, &c. 21 10*

MANUFACTURE OF PATENT WIRE Ropes and Cables—for inclined planes, suspension bridges, standing rigging, mines cranes, derick, tillers &c.; by JOHN A. ROEBLING; Civil Engineer—Trenton N. J. 47 1y*

PATENT CAR AXLE LATHE—I am now manufacturing, and have for sale, the above lathes; weight, 5,500 pounds, price $600. I will furnish a man with each lathe, who will turn and finish axles for 50 cents each, if desired. I have also for sale my patent engine screw lathe, for turning and chucking tapers, cutting screws and all kinds of common job work, weight 1500 lbs., price $225. The above lathe warranted to give good satisfaction. J. D. WHITE, Hartford, Ct. 7 6m*

LOGAN VAIL & CO., No. 9 Gold street, New York, agents for George Vail & Co., Speedwell Iron Works, have constantly on hand Saw Mill and Grist Mill Irons, Press Screws, Bogardus' Horse-Powers, and will take orders of Machinery of any kind, of iron and brass; Portable Saw-mills and Steam Engines, Saw Gummers of approved and cheap kind, &c. Gearing, Shafting, large and small, cast or of wrought iron. 11 1y

HAWKIN'S Stave Dressing Machine—Is now in operation in the city of Milwaukie, Wis., and will dress from 6 to 8000 staves per day, ready for the truss hoops, and at one operation. Rights for States and Counties, and also machines, for sale, apply to WM. HAWKINS, Patentee, Milwaukie, Wis. 15 20*

A. B. ELY, Counsellor at Law, 46 Washington st., Boston, will give particular attention to Patent Cases. Refers to Munn & Co., Scientific American. 13tf

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SCIENTIFIC MUSEUM.

For the Scientific American.

Yankee Enterprise.---Transporting Timber from the Mountains.

Your paper being the repertory of all that is new and useful, I propose to give you an account of a new form of overcoming resistance, used by Mr. Cochran, an enterprising Yankee of East Dorset, Vt. Allow me to premise that, during the construction of the Western Vt. Railroad, it became necessary that a very large amount of railroad ties should be procured in a very short time; whereupon Mr. C. (who is one of the Directors) contracted to furnish 30,000 yellow birch ties and a large amount of bridge and other timber. As the only place from which Mr. C. could procure the ties and timber was three miles distant from the railroad, on the tops of the Green Mountains, in a place inaccessible by any feasible road. Mr. C.'s friends and foes joined in predicting that it was impossible for him to fulfill the contract. Mr. C. ascended through a rocky ravine to the mountain's top, and there gathered, in one vast pile, 32,000 ties, and other timbers. Then the question arose with every one, by what means is all this to be conveyed to the railroad? Only a few weeks of hot summer weather is allowed to accomplish it in, and nothing but rocks and gulfs intervene. Surely "necessity is the mother of invention." Mr. C. goes to work and builds a small substantial spout or flume of long narrow plank stretching from rock to rock down the mountain gorge. Here it rests on a rock, there high on the branches of a tree, and there again high in the air it threads across the valley, supported like a telegraphic wire. In four or five weeks the whole three miles is completed—all built in the most simple, cheap, and substantial manner. A small stream of water is turned into the flume, and twenty men go merrily to work dashing in the heavy ties and timbers; away they fly on the wings of the water over rock and gulfs swifter than the wings of a dove. In four summer days that pile of 3,500 tons of lumber is conveyed without cost from the Green Mountains in Perr to the railroad in Dorset.

The flume remains still uninjured ready for further use, Mr. C.'s thousand's of acres of land (heretofore worthless), is now willing to be cleared of its rich burden of lumber and fuel, and be transported by the same magic process. The limpid stream is willing still to do its part; and more willing than all is Mr. C. to perform another such feat. M.M.M.

East Dorset, Vt.

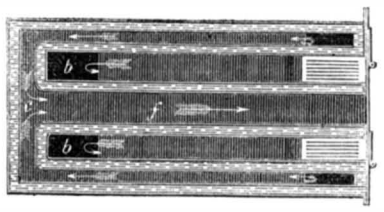
Manufacture of Combs.

The greatest comb manufactory in the world is in Aberdeen, Scotland; it is that of Messrs. Stewart, Rowell & Co. There are 36 furnaces for preparing horns and tortoise-shell for the combs, and no less than 120 iron screw presses are continually going, in stamping them. Steam power is employed to cut the combs, and an engine of fifty horse-power is barely sufficient to do the work. The coarse combs are stamped or cut out—two being cut in one piece at a time, by a machine invented in England in 1828. The fine dressing combs and all small-tooth combs, are cut by fine circular saws, some so fine as to cut 40 teeth in the space of one inch, and they revolve 5,000 times in a minute. There are 1928 varieties of combs made, and the aggregate number produced, of all these different sorts of combs, average upwards of 1200 gross weekly, or about 9,000,000 annually; a quantity that, if laid together lengthways, would extend about 700 miles. The annual consumption of ox-horns is about 730,000; the annual consumption of hoofs amounts to 4,000,000; the consumption of tortoise-shell and buffalo-horn, although not so large, is correspondingly valuable; even the waste, composed of horn-shavings aad parings of hoof, which from its nitrogenized composition, becomes a valuable material in the manufacture of prussiate of potash, amounts to 350 tons in the year; the broken combs in the various stages of manufacture average 50 or 60 gross in a week; the very paper for packing costs $3,000 a-year.

A hoof undergoes eleven distinct operations before it becomes a finished comb. In this great comb factory, there are 456 men and boys employed, and 164 women—in all 620 hands. This company commenced business twenty years ago, on a very small scale, being much smaller than the smallest works in England. By that determined energy, perseverance, and shrewdness which is characteristic of that people, they have shot ahead of all competitors in Britain. There is a temperance society and a library connected with the works.

On Boilers.---No. 15.

Fig. 26.



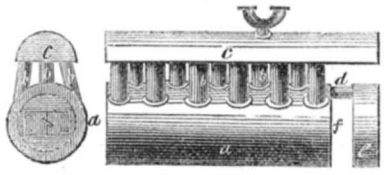
Frazier's Boiler.—This boiler was patented by James Frazier, of Hounsditch, Eng., in 1827. It was intended for a steamboat.

Fig. 26 is a horizontal section. There are two furnaces, the current of air and flames from which first proceed horizontally, as shown by the arrows, then descending at *b b*, they unite and take a contrary course in a wider channel, immediately underneath the upper one, to the front of the boiler; here the current separates, a part going as it were to the right, and a part to the left, into the narrow side flues at the farthest extremity of which, *e*, the currents unite again, and proceed by the middle channel, *f*, to the front of the boiler, where they ascend into the chimney. The steam pipe, safety valves, manhole, &c., being the same as in other boilers.

This boiler being especially designed for the use of steam-boats, no part of the furnace or flue is allowed to come in contact with the wood-work of the vessel, but is wholly surrounded by water; the disposition of the latter in thin layers, divided by long intervening flues, is ingenious, and well calculated to produce steam with rapidity and economy.

Tippett's Boiler.—Fig. 27 is a front end view, and fig. 28 a side view, of a boiler patented by Thomas Tippett, of Cornwall, Wales, in 1828.

Fig. 27. Fig. 28.



a is a double cylinder of the usual construction of the cylindrical boiler, the internal cylinder constituting the fire-place and flue. From the external cylinder, which contains water, proceed three rows of open vertical pipes, *b b b*, which support a semi-cylindrical vessel, *c*. At the farthest extremity of the cylinder, *a*, proceeds horizontally a short open pipe, *d*, communicating with a small supplementary boiler, which is a cylinder of the same area as *a*, but very short. This boiler is built in a furnace, in which the flues are so arranged, that the heated air, in passing out at the end *f* of *a*, shall impinge against the vertical side of the supplementary boiler; the flue thence proceeds upward and along the underneath flat side of the semi-cylindrical vessel, and between the vertical tubes to the front of the boiler; here it descends and passes under, *a*, round the back of the supplementary boiler, then rises again over the top of the semi-cylindrical vessel, and proceeds to the chimney, which is in front, nearly over the furnace doors.

The Orinoco.

This is the name of a new steamship belonging to the West India Co., and was to be the consort of the untortunate Amazon; she is of the same size—2,245 tons—about the size of the Asia. She is built so as to be fitted up, if necessary, with a tremendous armament. Her engines were built by Messrs. Maudsley, Sons & Field, of London, the gentlemen who built the engines of the Great Western, and who have a high reputation as engineers. The engines are peculiar; they are 400 horse-power. They are different from any of our marine engines, or those of the Scotch steamers. Each engine has two cylinders 68 inches in diameter, being equal to 98 inches in the single cylinder. They are direct acting, and not like the side lever kind. There are eight boilers, each one has three furnaces, and the aggregate evaporative power is 9,000 gallons of water per hour. The paddle wheels are 40 feet in diameter and are on the feathering principle—(Galloway's Wheel). The engines are said to be beautiful; they are at least different from any in our steamships. The feathering paddles, are new to us in marine vessels. The Amazon, in a trial of speed made 12½ statute miles per hour, with 13 revolutions per minute; the steam pressure 12 lbs. This was very good. Our engineers must keep a look out for the performances of the feathering paddle-wheel. It is our opinion that it will not answer so well for the stormy Atlantic voyages, but if it does, we must adopt it in our new steamships.

Extinguishing of Fires.

It is our opinion that no man in England is qualified to invent a Fire Annihilator suitable for practicable purposes in America. This opinion is advanced not to throw any disrespect on the inventors of England—we esteem them highly, but to invent any machine or apparatus suitable to accomplish a certain object, requires an acquaintanceship with the conditions of the evil to be remedied. In England there are few conflagrations in comparison with those in the United States. Our houses generally contain far more timber than the English, and when ignited they go like tinder. Our firemen, by constant exercise, are the most expert in the world, and they are quite capable of judging about this and that invention, got up for the extinguishing of fires. We are acquainted with a very ingenious Englishman in this city, who invented a machine for sawing down standing trees; he thought it was a great invention, but he had never cut down a tree in his life. We soon convinced him of his error.

We have just received the specification of a patent, granted in England to Mr. Charles Cameron, a very eminent chemist, of whom we have heard a number of times; the patent is for a new application to extinguish fires. The nature of it consists in mixing ground chalk, or aluminous clays, in a finely subdivided state, with water, and applying this liquid compound to the flames of a fire by a fire-engine. The quantity of whiting or aluminous clay, that would be required for fires in our city, would lead to an expense far greater than all the benefits that could accrue from the same. The whiting is put into a large tub—the waters from the hydrants are let into the tub, which mixes them all together, and then the suction of the fire-engine is placed in the tub, and the order passed "play away boys." Our firemen would not be troubled with such an arrangement; but there can be no doubt of the virtues of limous and aluminous waters in resisting the action of fire. A short time ago a gentleman inquired of us if he could get a patent for using alkaline leys to extinguish fires. We said, no: the nature of aluminous clays and alum water, in resisting the action of fire, is well known to every chemist.

Cure for Toothache.

Mr. James Beatson, of Airdrie, Scotland, says:—

"Gum copal, when dissolved in chloroform, forms an excellent compound for stuffing the holes of decayed teeth I have used it very frequently, and the benefit my patients have derived from it has been truly astonishing. The application is simple and easy. I clean out the hole, and moisten a little cotton with the solution; I introduce this into the decayed part, and in every instance the relief has been almost instantaneous. The chloroform removes the pain, and the gum copal resists the action of the saliva; and as the application is so agreeable, those who may labor under this dreadful malady would do well to make a trial of it.—[Medical Times and Jour. Dent. Science.

Saliva.

Human saliva, when fresh, is colorless or bluish. Saliva is necessary for the digestion of starch, which is converted by it into sugar, which cannot be affected by gastric juice. By a careful analysis, the following substances have been found in saliva: phosphorous, soda, colorium, potash, sulphur, cyanogen, lime, magnesia, and organic matters.

Steamship Baltic.

This noble steamship left this city for Washington on Wednesday last week. She arrived there on Friday, (opposite Alexandria) at 1 P. M. The invited guests who went with her had a fine time of it. We hope that Congress will make a further appropriation to this noble line of steamships.

The steamer Prometheus arrived at this port on last Saturday morning from San Juan She brought $90,000 in gold dust. Much stabbing and the like were still going on in California.

LITERARY NOTICES.

The Ancient History of Herodotus—Translated from the original Greek by William Beloe, with the life of Herodotus; Bangs, Brother & Co., 13 Park Row, N. Y., pages 490. Cicero denominated Herodotus the Father of History, and the chronicler informs us that he was born 484 B. C., we are therefore eminently interested in whatever record he has transmitted to us of the barbarous ages. His writings have been severely questioned in times past, but the interesting discoveries of Layard & Rawlinson. In Ninevah and Babylon was vindicated the general correctness of this history. The style is simple and eloquent, and few authors have appeared since his day with an easier style of address.

His description of the once proud Babylon as he saw it, is thrillingly interesting, and will repay an attentive perusal.

The same firm have issued Gellies' History of Ancient Greece, containing the same amount of matter. It is a work of unquestioned merit, and is probably the most reliable extant. These publications are timely, and the public will thank Messrs. Bangs, Bro. & Co. for supplying a want which is doubtless felt to a great extent, and no person at all interested in historical writing should suffer the present opportunity to pass unimproved. We have scarce ever read a work of greater excellence than Gellies' Greece. The author was an eminent Greek scholar and royal histriographer of Scotland.

Quinten Matsys, or the Blacksmith, of Antwerp—Published by Garrett & Co., N. Y., is the title of a new romance by Pierce Egan, an able English Editor. His writings, we believe, have been well received, but as we cannot find time to read the one before us, our readers must judge its character without our endorsement.

The Practical Model Calculator.—Nos. 7 and 8 of this excellent work, by Oliver Byrne, C. E, published by H. C. Baird, of Philadelphia, are now before us This work, when completed, will be a very valuable book to our mechanics and engineers; it is the most comprehensive work relating to all subjects in which calculations are necessary: it treats of logarithms, trigonometry, hydraulics, surveying, and mathematical calculations in general. It is for sale by Dewitt & Davenport, this city.

Lays of the Scottish Cavaliers—Mr. Redfield, publisher, Clinton Hall, this city, has given the American Republic a most excellent reprint of this book of poems, by Prof. Aytoun, Editor of Blackwood's Magazine. These Lays come up to the ancient and thrilling Ballads which give us so much pleasure to read. Old Hardyknute and Chevy Chase, have oftentimes made the blood course through our veins in rapid order. These lays especially recommend themselves to Scotchmen in our country who often look back with a kind of joyous grief to their "auld mountain mither." The history of Scotland is one unbroken romance, from the days of Macbeth to those of Charles Stewart. Prof. Aytoun is a Jacobite, and many of these are Jacobite Lays, still we like them, but our sympathies are all with the brave old Covenanters—those men who, with the Puritans, formed the Solemn League & Covenant, and did so much for Liberty and Parish Schools.

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